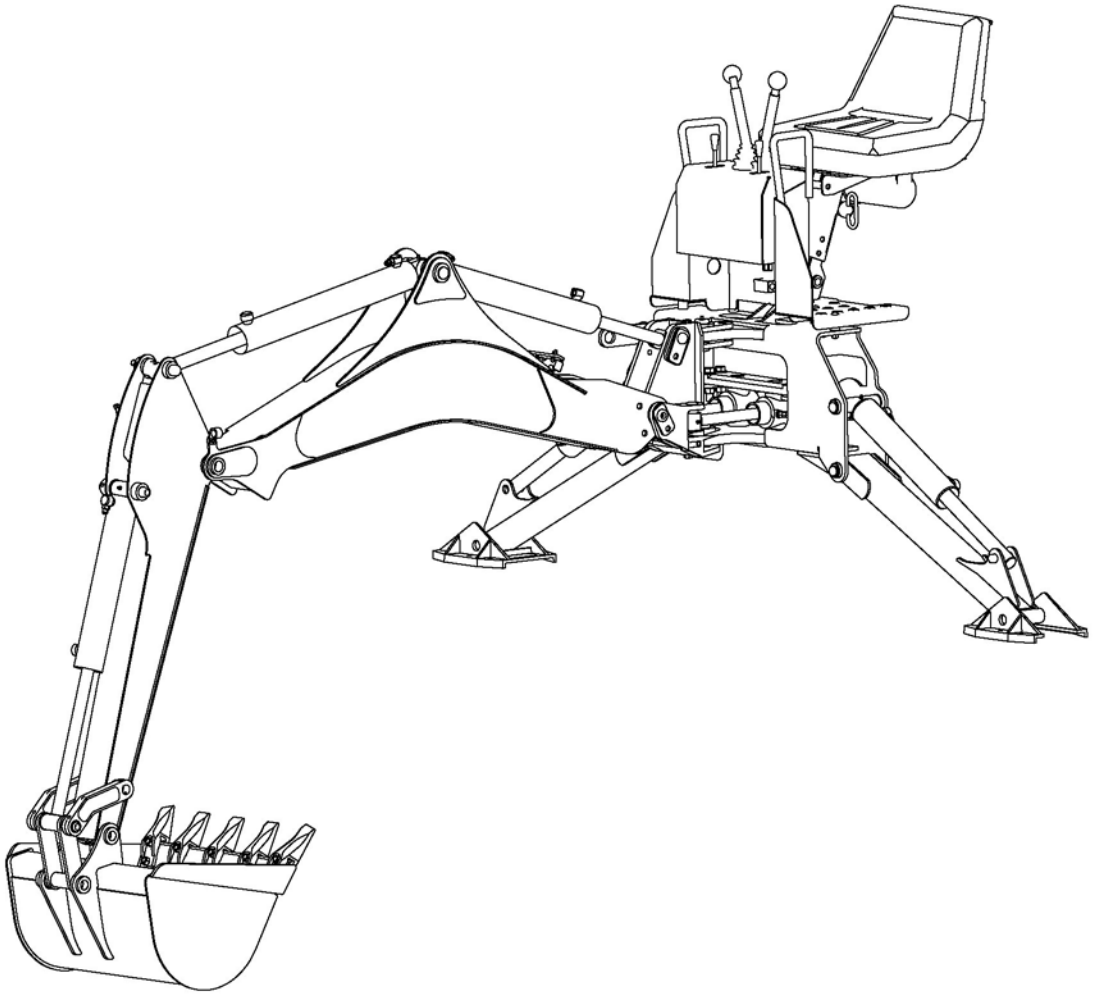
WOODS

BACKHOE

BH70-X, BH80-X



OPERATOR'S MANUAL

WOODS®
Tested. Proven. Unbeatable.

MAN0450
(Rev. 3/9/2010)

TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Woods® dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the online Product Registration form at the Woods Dealer Website which certifies that all Dealer Check List items have been completed. Please contact your dealer to complete this form. Dealers can register all Woods product at dealer.WoodsEquipment.com under Product Registration.

Failure to register the product does not diminish customer's warranty rights.

TO THE OWNER:

Read this manual before operating your Woods equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Woods dealer has trained mechanics, genuine Woods service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Woods service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model: _____ **Date of Purchase:** _____

Serial Number: (see Safety Decal section for location) _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **NOTICE** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION, WARNING,** and **DANGER** are used in conjunction with the Safety-Alert Symbol (a triangle with an exclamation mark) to indicate the degree of hazard for items of personal safety.

⚠	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
⚠ **DANGER**	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
IMPORTANT or ***NOTICE***	Is used to address practices not related to personal injury.
NOTE	Indicates helpful information.

ALITEC™
BMP®
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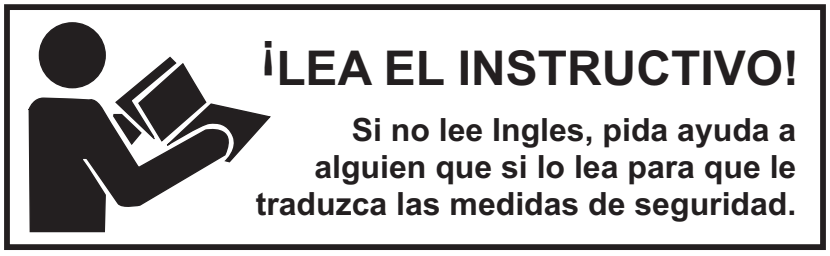
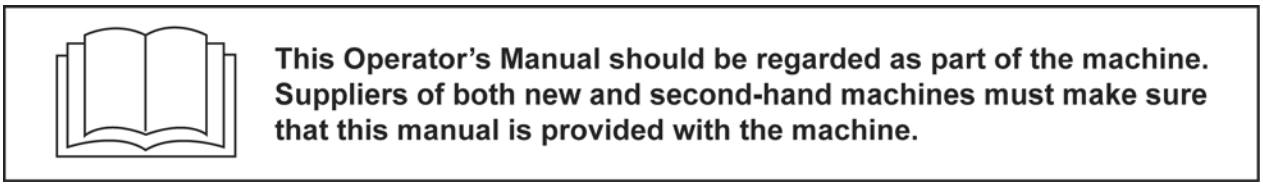



This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.

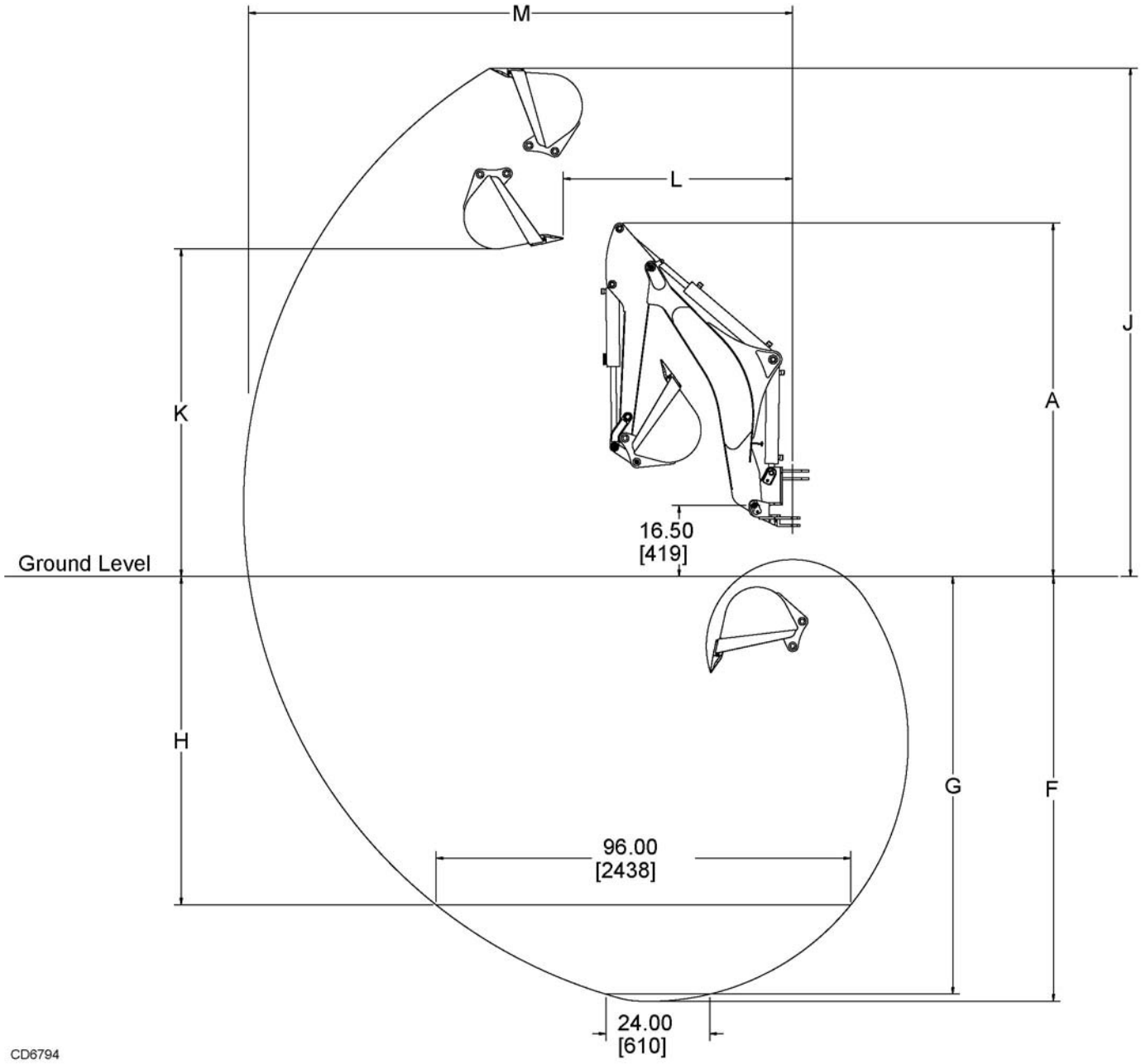
BH70-X & BH80-X SPECIFICATIONS

Description	Illustration	English		Metric	
		BH70-X	BH80-X	BH70-X	BH80-X
Transport Height*	A	74.75"	82.25"	1899 mm	2090 mm
Stabilizer Spread (Transport)*		58.5"	58.5"	1486 mm	1486 mm
Angle of Departure**		15°	15°	15°	15°
Digging Depth, Maximum*	F	86.25"	98."	2191 mm	2489 mm
Digging Depth, 2 ft. Flat Bottom*	G	84.5"	96.5"	2146 mm	2451 mm
Digging Depth, 8 ft. Flat Bottom*	H	61.25"	75.75"	1556 mm	1924 mm
Overall Operating Height*	J	108.25"	117.25"	2750 mm	2978 mm
Loading Height*	K	66"	75.25"	1676 mm	1911 mm
Loading Reach*	L	45.25"	52.5"	1149 mm	1334 mm
Reach from Swing Pivot*	M	113.5"	125.5"	2883 mm	3188 mm
Bucket Rotation*		180°	180°	180°	180°
Swing Arc*		180°	180°	180°	180°
Stabilizer Spread (Operating)*		88.5"	88.5"	2248 mm	2248 mm
Leveling Angle*		10°	10°	10°	10°
Operating Pressure*		2030 psi	2470 psi	14.0 Mpa	17.0 Mpa
Operating Flow		4 - 6 gpm	5 - 7 gpm	15 - 23 lpm	19 - 26 lpm
Bucket Digging Force*		3110 lbs	3780 lbs	13834 N	16814 N
Dipper Digging Force*		2000 lbs	2480 lbs	8896 N	11032 N

Bucket Capacity (Heaped)		cu.-ft.	cu.-meter
9" (203 mm)		0.77	0.022
12" (305 mm)		1.13	0.032
16" (406 mm)		1.64	0.046
18" (457 mm)		1.90	0.054
24" (610 mm)		2.67	0.075

* Per Definitions in SAE J49 Standard
** Per Definitions in SAE J1234 Standard

BH70-X & BH80-X SPECIFICATIONS



GENERAL INFORMATION

The purpose of this manual is to assist in setting up, operating and maintaining your backhoe. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance.

These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing, but due to possible in-line production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

⚠ WARNING

■ **Some illustrations in this manual show the backhoe with safety shields removed to provide a better view. The backhoe should never be operated with any safety shielding removed.**

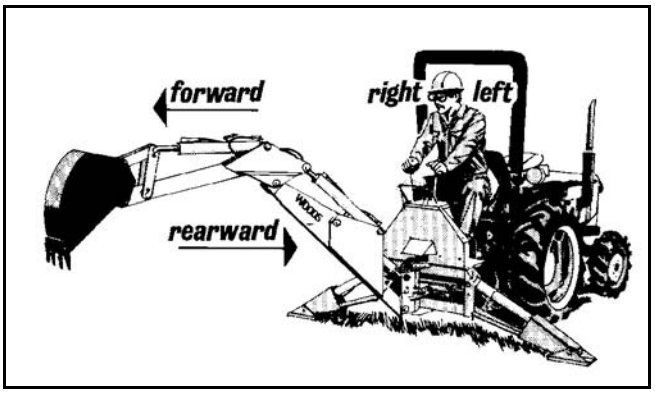


Figure 1. Backhoe Directions

Throughout this manual, references are made to right, left, forward and rearward directions. These are determined from the backhoe operator seat position facing rearward as shown in Figure 1.

Terms for backhoe components have some variations throughout the industry. We use SAE designations as shown in Figure 2.

1. Bucket
2. Bucket cylinder
3. Dipper cylinder
4. Boom cylinder
5. Console
6. Stabilizer
7. Swing cylinder
8. Boom
9. Dipper
10. Stabilizer cylinder
11. Swing frame
12. Main frame

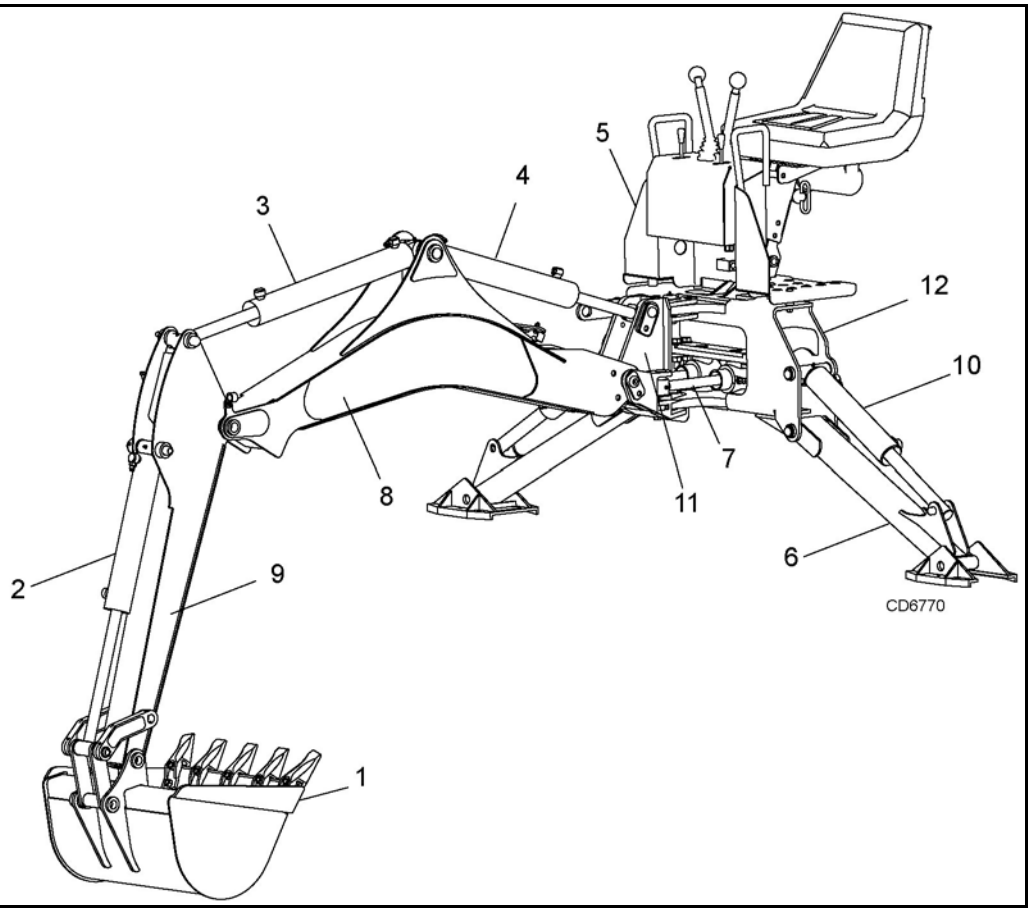


Figure 2. Backhoe Components

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.

It has been said, "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

INSTALLATION

■ **Hydraulics must be connected as instructed in this manual. Do not substitute parts, modify, or connect in any other way.**

■ **After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.**

TRAINING

■ **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.) Failure to follow instructions or safety rules can result in serious injury or death.**

■ **If you do not understand any part of this manual and need assistance, see your dealer.**

■ **Know your controls and how to stop engine and attachment quickly in an emergency.**

■ **Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.**

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Never allow children or untrained persons to operate equipment.**

PREPARATION

■ **Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.**

■ **Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.**

■ **After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.**

■ **Protective hose sleeves must cover all hydraulic hoses within 20 inches of the operator and be secured onto metal hose fittings. Replace hoses or sleeves if damaged or if protective sleeve cannot be properly positioned or secured.**

■ **Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.**

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

■ **Make sure attachment is properly secured, adjusted, and in good operating condition.**

(Safety Rules continued on next page)

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

(Safety Rules continued from previous page)

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **Only mount this backhoe on Category 1 tractors with 800 lb. lift capacity at 24" behind 3-point lift arm hitch balls.**

■ **Never put backhoe into service unless backhoe manufacturer's 3-point hitch Saf-T-Lok® limiter or sub-frame has been installed and adjusted.**

■ **To avoid possible hitch failure, read and follow the Saf-T-Lok Limiter Installation Instructions in the Assembly section before mounting backhoe to tractor 3-point hitch.**

■ **Remove seat and upper support assembly before installing or removing backhoe from tractor. Failure to comply may result in equipment failure and/or personal injury.**

■ **Do not operate backhoe unless there is adequate operator clearance as shown on safety decal. (Refer to Danger decal in Safety Decal section.)**

■ **Always use the special heavy-duty top link (provided with backhoe) and the OEM high-strength top link pin (provided with tractor) to mount the top link to tractor. Use 3/4" x 3-1/2" grade 5 bolt(s) to mount top link to backhoe.**

■ **Be sure that backhoe is properly mounted, adjusted, and in good operating condition.**

■ **Place and keep 3-point lift quadrant lever in lowered position at all times.**

■ **If tractor is equipped with draft sensing control, set control to "HEAVY" (minimum sensitivity) position.**

■ **Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

■ **Make sure shields and guards are properly installed and in good condition. Replace if damaged.**

■ **A minimum 20% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.**

■ **Do not install backhoe and required counterweights on tractor if the total tractor and equipment weight then exceeds the ROPS weight certification of the tractor. To reduce overall weight of unit, remove liquid from rear tires and remove mid-mount mower, if equipped.**

■ **Clean all dirt, trash, and grease from operator's platform and steps.**

OPERATION

■ **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**

■ **Before operating, make sure stabilizer pads are lowered firmly to the ground. Stabilizer arms provide support for the backhoe and support for the backhoe mounting brackets.**

■ **Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.**

■ **Keep bystanders away from operator, stabilizer, and maximum bucket swing areas.**

■ **Do not operate or transport equipment while under the influence of alcohol or drugs.**

■ **Operate only in daylight or good artificial light.**

■ **Always comply with all state and local lighting and marking requirements.**

■ **Do not allow riders. Do not lift or carry anybody on the power unit or attachments.**

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:**

- **Read Mounting Kit Manual instructions on attaching and removing backhoe and use extreme care.**
- **Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid being trapped should the boom swing control be accidentally activated.**

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

■ When operating controls, always sit in backhoe seat.

■ Operate tractor PTO at 540 RPM. Do not exceed.

■ Always dump spoil at least two feet away from opening.

■ Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.

■ Be careful when swinging loaded bucket on a hillside. Always dump spoil on uphill side of backhoe to minimize the possibility of upset.

■ Never leave equipment unattended with engine running or with bucket in raised position. Always engage swing and boom transport locks, relieve system pressure by operating controls, and remove ignition key before leaving equipment.

■ Do not use backhoe for craning; it is primarily designed for digging. Mechanical failures such as hose rupture will cause a load to drop suddenly.

TRANSPORTATION

■ Always engage swing and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.

■ Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.

■ Never exceed 20 mph (32.2 km/h) during transport.

■ Always comply with all state and local lighting and marking requirements.

■ Never allow riders on power unit or attachment.

■ Do not operate PTO during transport.

■ Do not operate or transport on steep slopes.

■ A minimum 20% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.

■ Do not operate or transport equipment while under the influence of alcohol or drugs.

MAINTENANCE

■ Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.

■ Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.

■ Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.

■ Adjustment of system relief pressure must be done by a qualified, experienced dealership. Incorrect adjustment can result in system failures and serious personal injury.

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

■ Dealer service personnel must perform work that requires engine operation during service.

■ Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before performing maintenance or service or before disconnecting any hydraulic lines.

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

■ Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.

■ Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)

■ Make sure shields and guards are properly installed and in good condition. Replace if damaged.

STORAGE

■ Block equipment securely for storage.

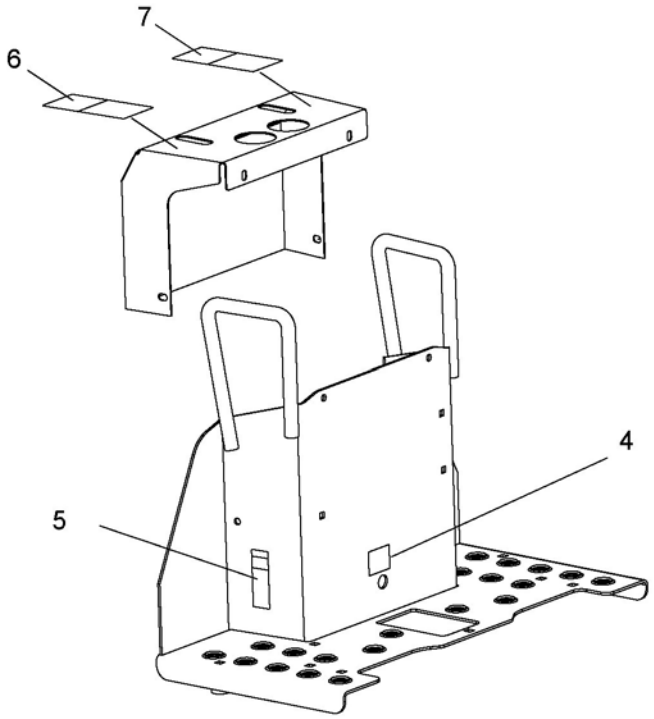
■ Keep children and bystanders away from storage area.

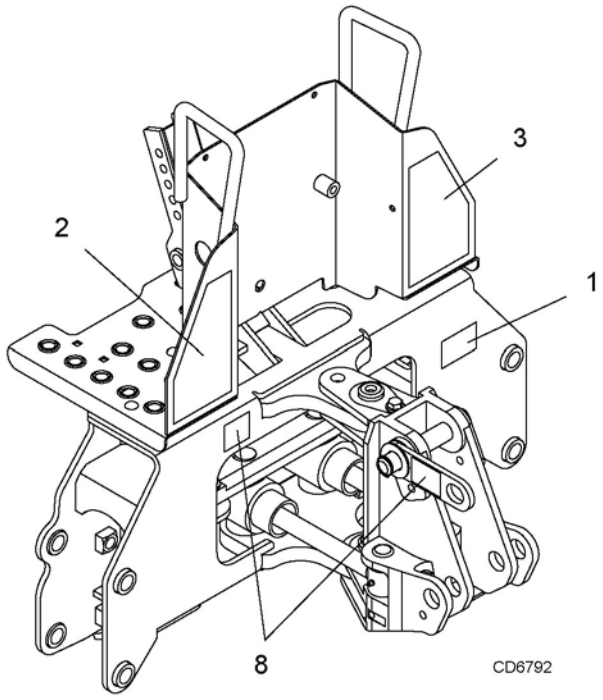
■ Refer to Removing and Storing Backhoe in Operation section of backhoe manual.

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

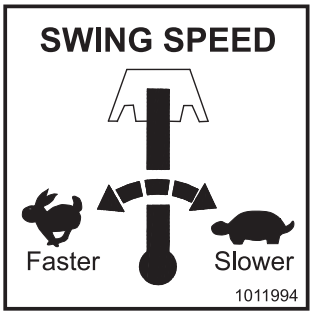
Replace Immediately If Damaged!





1 - SERIAL NUMBER PLATE

4 - PN 1011994
BH80-X Only



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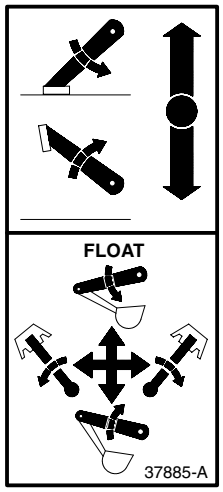

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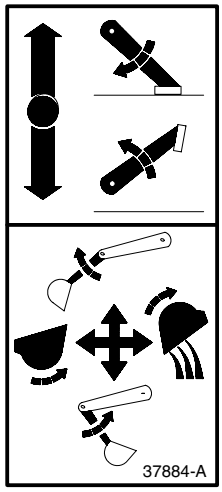
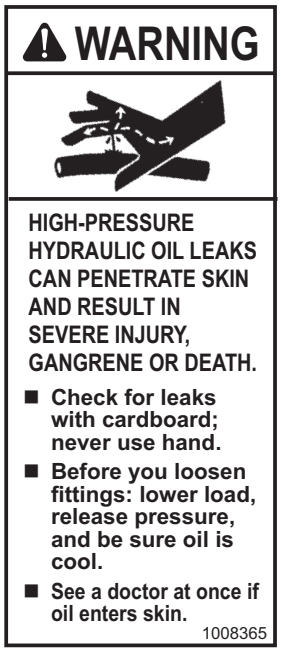
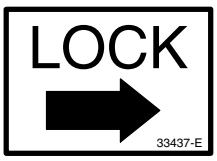


5 - PN 1008365


WARNING
HIGH-PRESSURE HYDRAULIC OIL LEAKS CAN PENETRATE SKIN AND RESULT IN SEVERE INJURY, GANGRENE OR DEATH.
Check for leaks with cardboard; never use hand.
Before you loosen fittings: lower load, release pressure, and be sure oil is cool.
See a doctor at once if oil enters skin.
1008365

8 - PN 33437



SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!

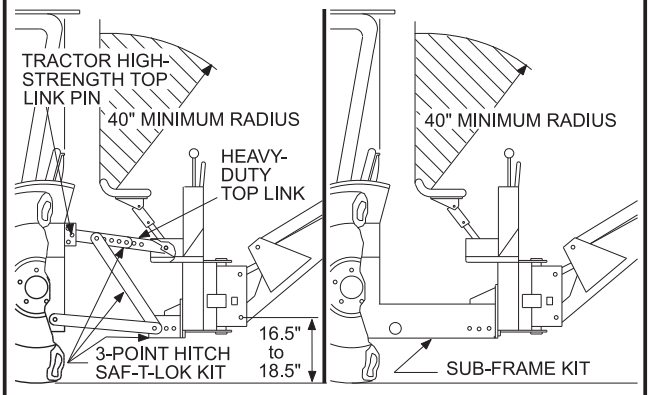
2 - PN 1011992

DANGER

CRUSHING HAZARD

- Never operate without **3-point hitch Saf-T-Lok® kit** or **sub-frame** installed as instructed in the Operator's Manual.
- Operator's area (shaded area of 40" radius) must be free from all obstructions.
- Use heavy-duty top link provided in **3-point hitch Saf-T-Lok kit** or **sub-frame kit**.
- Use tractor manufacturer's high-strength top link pin of at least 3/4" diameter. See manual details.

Failure to follow the above instructions may result in serious injury or death from backhoe being thrust upward, forward, or rearward by digging forces.



BH70-X/BH80-X 1011992

3 - PN 1011993

WARNING

TO AVOID SERIOUS INJURY OR DEATH,

- Before operating, read and follow all safety precautions in Operator's Manual (available from your dealer).
- Make sure all safety decals are installed and readable.
- Make sure all shields are properly installed.
- Never allow riders.
- Remove seat and upper support assembly before installing or removing backhoe.
- Only mount on Category 1 tractors under 35 hp with 800 lb. lift capacity at 24" behind hitch balls.
- Maximum allowable hydraulic flow is 8 gpm at 2400 psi (BH80-X) or 2000 psi (BH70-X).
- Do not use "3-point quick attaching coupler".
- Lock out the draft sensing or set control to "Heavy".
- Do not modify or substitute any mounting or backhoe parts.
- A minimum 25% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position.
- Consult local utilities before digging to avoid contacting underground hazards.
- When operating, always sit in backhoe seat; keep bystanders away from maximum swing area.
- Operate PTO at 540 rpm.
- Backhoe digging forces can lift and turn tractor over. Make sure stabilizer pads are on firm ground and avoid soft or deep banks.
- Before transporting, attach SMV sign and engage transport locks.
- Before leaving unattended, raise boom and install transport locks, disengage PTO, relieve pressure on dipperstick and bucket, shut engine off, and remove key.

BH70-X/BH80-X 1011993

BE CAREFUL!

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your Woods dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

OPERATION

The operator is responsible for the safe operation of the backhoe. The operator must be properly trained. Operators should be familiar with the backhoe, the tractor, and all safety practices before starting operation. Read the safety rules and safety decals on pages 7 to 11.

⚠ DANGER

■ **Never put backhoe into service unless backhoe manufacturer's 3-point hitch Saf-T-Lok® limiter or sub-frame has been installed and adjusted.**

■ **Do not operate backhoe unless there is adequate operator clearance as shown on safety decal. (Refer to Danger decal in Safety Decal section.)**

⚠ WARNING

■ **Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.**

■ **A minimum 25% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. Weigh the tractor and equipment. Do not estimate.**

START AND STOP OPERATION

⚠ WARNING

■ **Operate tractor PTO at 540 RPM. Do not exceed.**

An optional tractor-driven PTO pump supplies hydraulic pressure for backhoe operation. Instructions for engaging and disengaging the PTO are in your tractor manual. Learn how to disengage PTO quickly should an emergency occur.

Never exceed 540 rpm. Operating the pump in excess of 540 rpm will cause overheating and equipment damage.

GENERAL OPERATION

⚠ WARNING

■ **Place and keep 3-point lift quadrant lever in lowered position at all times.**

■ **If tractor is equipped with draft sensing control, set control to "HEAVY" (minimum sensitivity) position.**

■ **Do not use backhoe for craning; it is primarily designed for digging. Mechanical failures such as hose rupture will cause a load to drop suddenly.**

■ **Never allow children or untrained persons to operate equipment.**

⚠ CAUTION

■ **When operating controls, always sit in backhoe seat.**

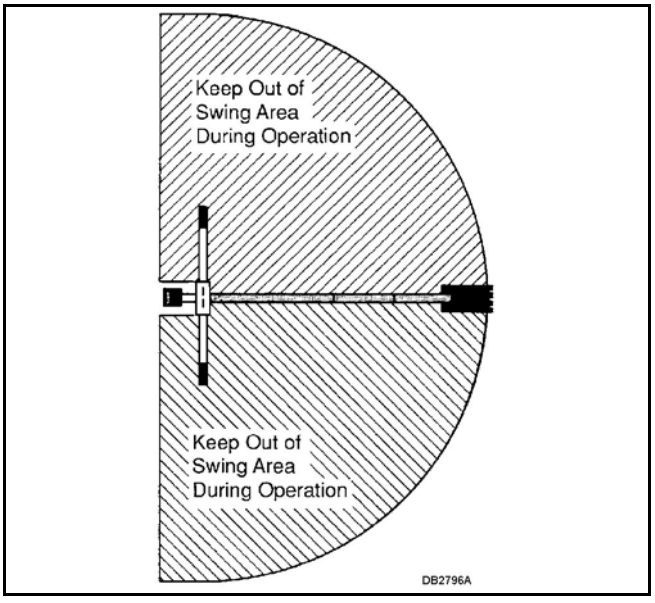


Figure 1. Backhoe Swing Area.

Mechanical failures such as a hose rupture will cause a load to drop. Lifting a heavy load with the dipper, then operating the boom, could cause boom to drop. In either case, if anyone is in the operating area (maximum reach of bucket) as shown in Figure 1, serious injury or death could occur.

Do not dig with backhoe unless stabilizers are down and on a firm surface. Stay clear of steep areas or excavation banks that are soft or could give way

POSITION THE MACHINE

Before operating in an unfamiliar area, walk around the full length of the proposed site and check for hidden holes, drop-off or obstacles that could cause an accident.

Lower stabilizers until they carry the weight of the backhoe. If tractor is equipped with a front loader, place the bucket flat on the ground. Lower loader lift arms until weight is removed from front tractor tires.

Level the machine using stabilizers and front loader before starting to dig.

Stability is very important when operating backhoe in the extreme swing positions as this causes weight transfer.

CONTROL HANDLE OPERATION

Refer to Figure 2.

Assume your position in the operator's seat.

When engaging optional PTO-mounted pump, engine rpm should always be low. Once engaged, engine rpm may be increased to desirable operation speed (not to exceed 540 rpm).

When becoming familiar with backhoe controls, start with a lower rpm.

Before operating, perform a functional test by placing control handles in their various positions and making certain correct operation occurs, matching decals on operator's console. Pay specific attention to float position of boom. Do not operate backhoe if functions differ from decal; serious injury or death could occur.

It is not difficult to become a successful operator. Control lever operating decals (shown in Figure 4) are next to the operating control levers. Study these decals; they will assist you in becoming familiar with the controls.

Pushing handle 1 forward will lower left stabilizer; pulling back raises it.

Pushing handle 2 forward will lower right stabilizer; pulling back raises it.

Pulling left control back (toward A) raises boom; pushing it forward (toward C) lowers it. Full forward (toward C) is the float position.

Moving left handle left (toward B) swings boom left; moving it right (toward D) swings boom right.

Pulling right control back (toward E) moves dipper down and toward operator; pushing it forward (toward G) moves it up and away from operator.

Moving right handle left (toward F) curls bucket toward operator; moving it right (toward H) extends bucket out away from operator.

Operate the control levers, swinging the boom several times to practice control. Do not operate the swing more than 45 degrees each way the first few times. Gradually increase arc.

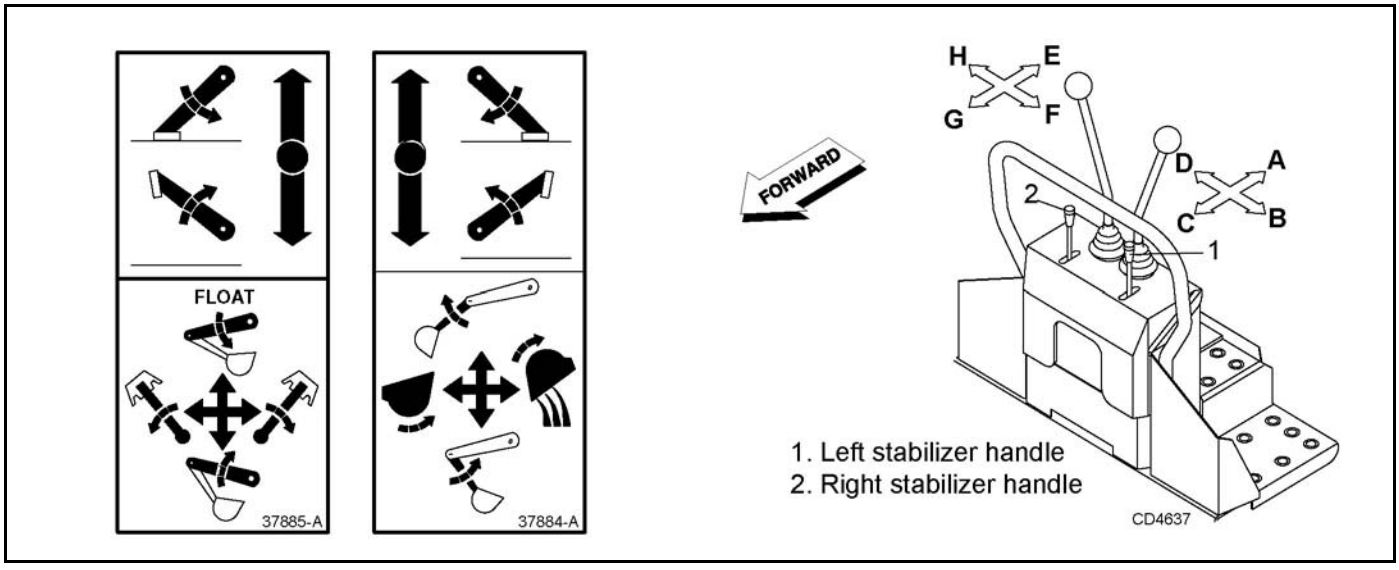


Figure 2. Operator's Controls (Typical View)

After becoming familiar with the backhoe operation, practice coordinated use of the controls in a safe open area at reduced engine speed. Gradually increase engine speed as the technique is mastered.

Operate backhoe gently and smoothly. Avoid swinging boom into mainframe. Sudden stopping or jerking could result in serious damage to tractor and backhoe.

Strive to develop a smooth digging cycle. Avoid abrupt or jerky movements. This is accomplished by operating two or more controls at the same time and not allowing the cylinders to reach the limit of travel.

Should you become confused during operation, simply let go of the controls. The valve control handles will automatically return to neutral.

BH80-X SWING SPEED CONTROL

The swing speed control valve is located on the back side of the console on BH80-X backhoes only. This controls the speed of the swing cylinders and allows for easier operation in tight areas. Turn knob to the right to Decrease swing speed and to the left to increase swing speed.

START EXCAVATION

⚠ WARNING

■ **Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.**

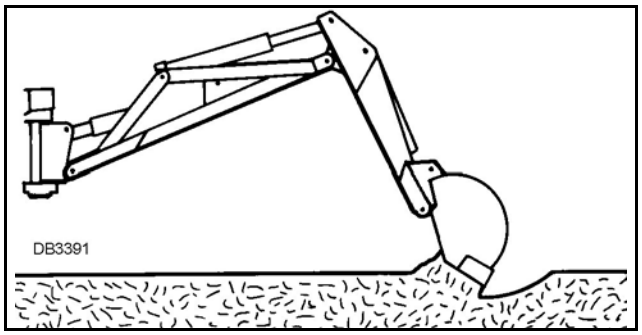


Figure 3. Starting Position

To start the excavation, position backhoe as shown in Figure 3 for maximum breakout force.

Actuate the dipper cylinder to start digging. Approximately halfway through digging cycle, start bucket curl while continuing crowding dipper in. Should bucket stall, raise boom slightly.

Do not use down pressure on the boom when starting to dig, as this will lift the machine and move it out of alignment with the work.

FILL BUCKET

Control bucket attitude throughout digging cycle to keep teeth parallel to bottom of excavation. This will provide best penetration angle and minimize dragging and scraping bucket through the ground.

Penetration depth is determined by soil condition and type.

Only use dipper and bucket during the digging cycle. As the dipper moves the bucket through the soil, curl bucket to maintain proper bucket position.

At the end of the pass, or when bucket is full, curl bucket completely, lift bucket from excavation and swing boom to dump site.

To obtain a cleaner trench and avoid material buildup directly in front of backhoe, extend dipper and curl bucket completely while starting to lift it out of the excavation. This will allow excess material to fall back into the excavation.

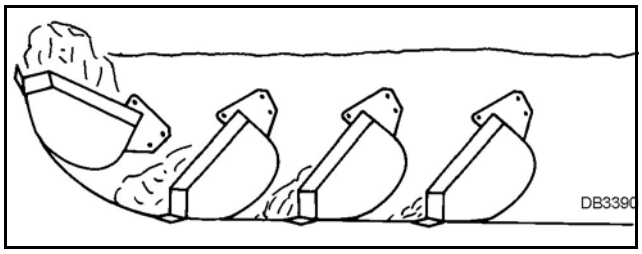


Figure 4. Fill Bucket

DUMP AND RETURN CYCLE

Keep the swing-dump-return cycle as brief as possible. Keep dipper moving outward and start boom swing as soon as the bucket clears the excavation. Continue extending dipper and, as you approach the spoil pile, start to dump bucket.

When bucket is empty, dipper and bucket are in position to resume digging upon return to the excavation.

TRENCHING AND EXCAVATING

Refer to Figure 5.

Trenching is the most basic backhoe digging operation. Other operations are variations of this basic function.

To maintain a level trench bottom, set bucket at proper approach angle and while crowding dipper-stick in, continually move bucket curl lever to maintain correct cutting angle. At the same time, place boom control in the full forward (float) position and keep the bucket in the same plane.

When handle is placed in the float position, pressure on both sides of boom cylinder is released.

Digging near center of swing so material may be dumped on either side will produce good results. Never dig near stabilizers.

Continue the trench by moving machine along trench centerline away from existing excavation. Move machine approximately one-half the effective backhoe reach. Moving too far will require excessive down pressure for digging and hand clean-up of trench bottom.

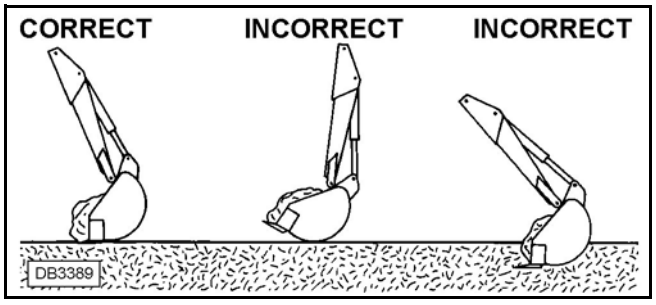


Figure 5. Trenching

SIDE SLOPE TRENCHING / EXCAVATING

⚠ WARNING

■ **Be careful when swinging loaded bucket on hillside. Always dump spoil on uphill side of backhoe to minimize rollover possibility.**

When operating on a side slope, the backhoe must be positioned using one of these two methods as shown in Figure 6 or Figure 7.

When operating on a side slope, always place the trench spoil on the uphill side.

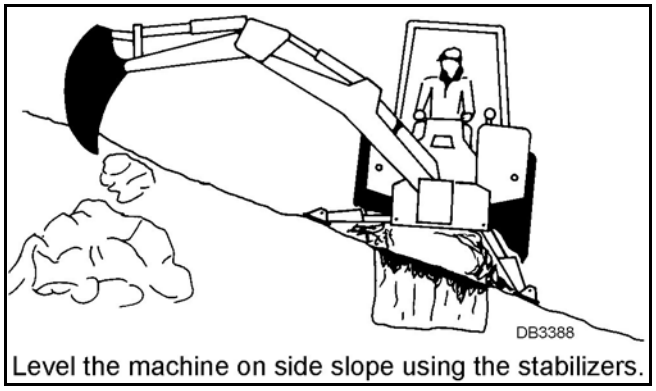


Figure 6. Level with Stabilizers

Cut a level pad for the uphill side of the machine and place spoil on the downhill side as shown in Figure 7.

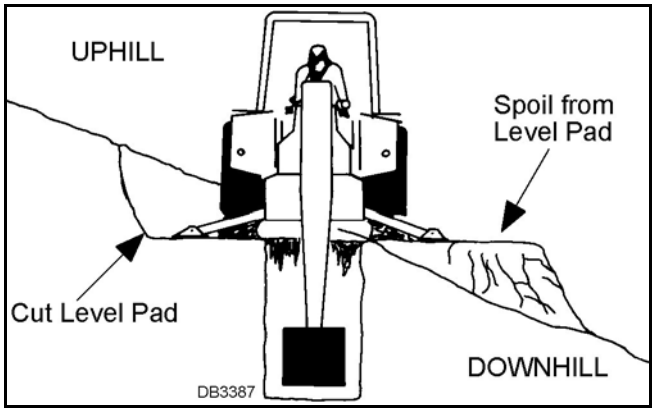


Figure 7. Level with Cut Out

TRANSPORTING

⚠ WARNING

■ **Always engage swing and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.**

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **Never leave equipment unattended with engine running or with bucket in raised position. Always engage swing and boom transport locks, relieve system pressure by operating controls, and remove ignition key before leaving equipment.**

Transport and Swing Lock Installation

IMPORTANT

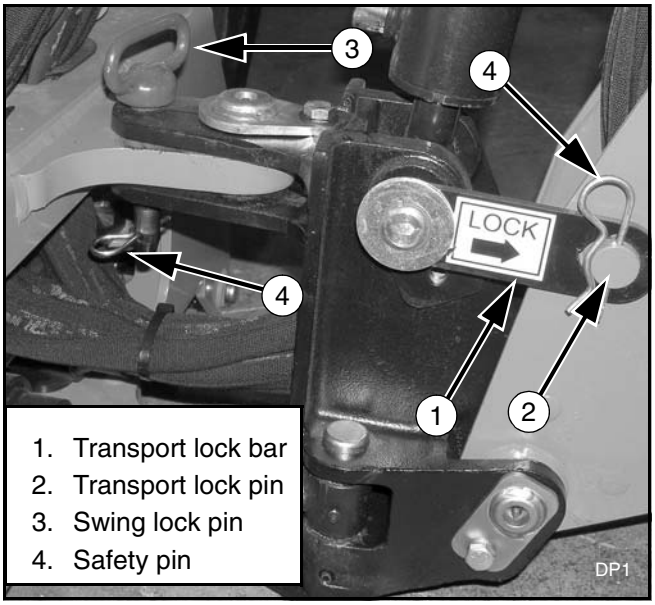
■ **Before operating backhoe, disengage transport lock bar and store swing lock pin. Push transport lock bar down fully to prevent damage.**

Engage transport lock by fully retracting boom and dipper. Position transport lock bar (1), located on right side of swing frame, over transport lock pin (2). Secure with safety pin (4). See Figure 8.

Center boom from side to side and install swing lock pin (3) through swing frame and main frame. Secure swing lock pin (3) with a safety pin (4) as shown.

During backhoe operation, store swing lock pin (3) in the hole provided on the back side of the seat post. Secure into position with safety pin (4).

Always raise stabilizers before transporting backhoe.



1. Transport lock bar
2. Transport lock pin
3. Swing lock pin
4. Safety pin

Figure 8. Transport and Swing Lock Installed

REMOVING AND STORING BACKHOE

⚠ DANGER

■ **The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:**

- **Read Mounting Kit Manual instructions on attaching and removing backhoe and use extreme care.**
- **Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid being trapped should the boom swing control be accidentally activated.**

⚠ WARNING

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

■ **Remove seat and upper support assembly before installing or removing backhoe from power unit. Failure to comply may result in equipment failure and/or personal injury.**

3-Point Mount Removal

Position tractor on a hard level surface, remove swing lock pin and transport bar, and center the backhoe boom.

Lower stabilizers and take weight of backhoe off of rear tractor tires.

Lower boom and dipper to form 90-degree angle and rest bucket on the ground.

Remove pin that attaches top link to tractor. Remove lower 3-point arms from backhoe. Place blocks under mainframe and raise stabilizers to lower backhoe mainframe onto blocks. Block backhoe as necessary to make it stable.

Disconnect hydraulic system.

4-Point Sub-Frame Mount Removal

NOTE: See the sub-frame mounting kit manual that fits your tractor for specific instructions.

Position tractor on a hard level surface, remove swing lock pin and transport bar, and center the backhoe boom.

Lower stabilizers and take weight of backhoe off of rear tractor tires.

Lower boom and dipper to form 90-degree angle and rest bucket on the ground.

Remove the seat assembly.

Remove klik pins from bolt and nut assemblies.

Use 1-1/2 inch open end wrench supplied with the mounting kit to remove hex nuts. Return wrench to storage position.

Use the boom to relieve excess pressure on 1-inch bolts and remove bolts.

Tilt backhoe mainframe forward and away from sub-frame.

Raise stabilizers (to lower backhoe) until backhoe brackets slide out of hooks on the sub-frame. Lower backhoe approximately 1-1/2 inch.

Move tractor forward to clear backhoe brackets.

Place 6 inch blocks under backhoe mainframe and raise stabilizers to lower backhoe to the storage position on blocks. Boom and dipper should be at 90-degree angle.

Disconnect hydraulic system.

Disconnect Tractor Hydraulics

For Backhoe Powered with Auxiliary Pump

Disengage the PTO, stop tractor engine and remove key. Remove pump from PTO and secure it on backhoe. Move tractor carefully away from backhoe.

For Tractors with Open-Center Valves (Figure 9)

Stop tractor and remove key.

Disconnect pressure and return hoses. Connect tractor pressure and return hoses together to complete open-center circuit. Connect backhoe pressure and return hoses together for storage.

NOTE: Circuit must be complete to prevent damage to tractor hydraulic system.

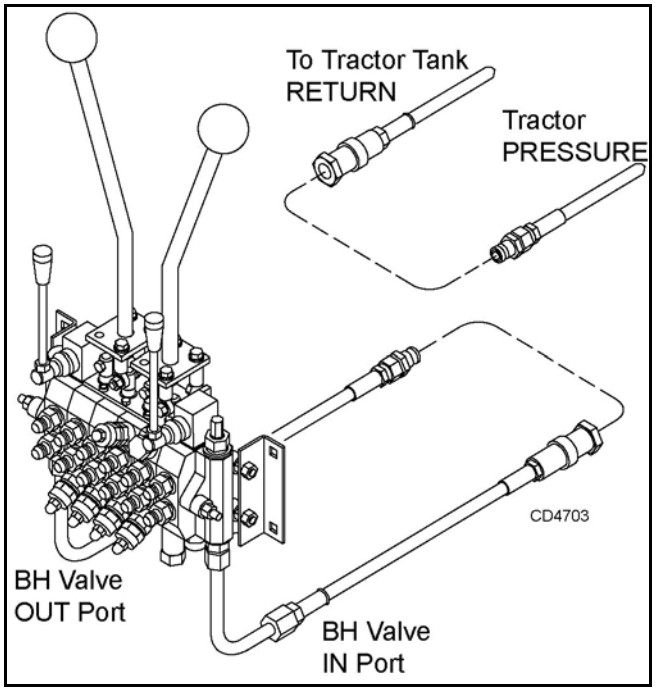


Figure 9. Tractors with Open-Center Valves

MECHANICAL THUMB (OPTIONAL)

The mechanical thumb is used for grabbing objects and securing them between the thumb and the bucket.

Become familiar with the geometry and extra weight the thumb adds to the backhoe before operating. Large heavy objects such as rocks and logs can increase momentum when pivoting backhoe to the side. DO NOT make sudden stops and starts. Be extremely careful lifting and moving long items such as poles or tree limbs which may extend beyond the normal backhoe operating area.

Improper usage can also damage the thumb or backhoe. DO NOT use the thumb to rake material, push or pull material, use the side of the thumb to move material, use as a lifting devise with chain or rope, or as a pry bar to dislodge objects.

Place thumb in operating position by selecting an appropriate pin location on the telescoping tube. Rotate the bucket to hold material against the thumb.

When normal backhoe operation is required, place thumb in storage position. Remove pin, rotate thumb up against dipper, and insert pin to lock thumb into position.

PRE-OPERATION CHECK LIST
(OWNER'S RESPONSIBILITY)

The operator should perform the following check list before operating backhoe.

___ Check that backhoe is properly and securely attached to tractor.

___ Make sure all hydraulic connections are tight and all hydraulic lines and hoses are in good condition before engaging tractor PTO.

___ Check that there are no leaks in the hydraulic system. Before operating, all hydraulic hoses must be routed properly and not be twisted, bent sharply, kinked, pulled tight or frayed.

___ During inspection, check that all nuts and bolts are secure and clevis pins are properly cotter pinned.

___ Be sure special heavy-duty top link, provided with backhoe, is installed.

___ Make sure only original equipment high-strength top link pin, provided with tractor, is used to attach top link to tractor.

___ Use a 3/4" x 3-1/2" grade 5 bolt to mount top link to backhoe.

___ Make sure tractor lower lift arm stabilizers (blocks or chains) are positioned to prevent lift arms and backhoe from swaying.

___ Place all backhoe controls in neutral position before starting tractor engine.

___ Check hydraulic reservoir level.

NOTES

OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.

⚠ WARNING

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before maintenance, service, or disconnecting any hydraulic lines.**

⚠ CAUTION

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

HYDRAULIC HOSES AND FITTINGS

IMPORTANT

■ **Fittings with O-rings and flange do not require additional sealant; replace damaged O-rings.**

Hydraulic hoses are severely worked on a backhoe. Examine them daily and replace if necessary. Hose routing is very important. Make certain hoses can move freely, without kinking, and cannot be damaged or cut by backhoe action.

When tightening hoses and fittings, always use two wrenches: one to hold hose and one to tighten fitting. This will prevent hose from twisting and kinking.

Always back lock nut off and screw fitting all the way in for fittings that use O-rings for sealing. Then hold in position and tighten lock nut.

RELIEF VALVE

BH70-X

This valve is pre-set at the factory to prevent system pressure from exceeding 2030 psi. Do not attempt to reset the valve for open-center hydraulic systems. If valve is malfunctioning, replace it with an authorized factory replacement part or have service done by a qualified dealer.

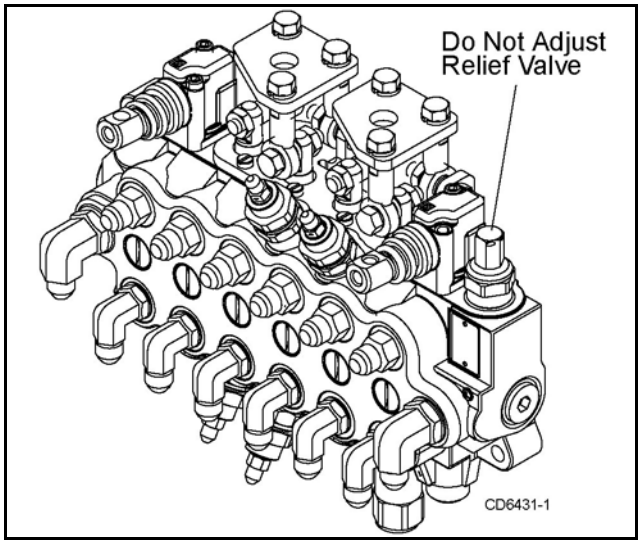


Figure 10. Relief Valve, BH70-X

BH80-X

This valve is pre-set at the factory to prevent system pressure from exceeding 2470 psi. Do not attempt to reset the valve for open-center hydraulic systems. If valve is malfunctioning, replace it with an authorized factory replacement part or have service done by a qualified dealer.

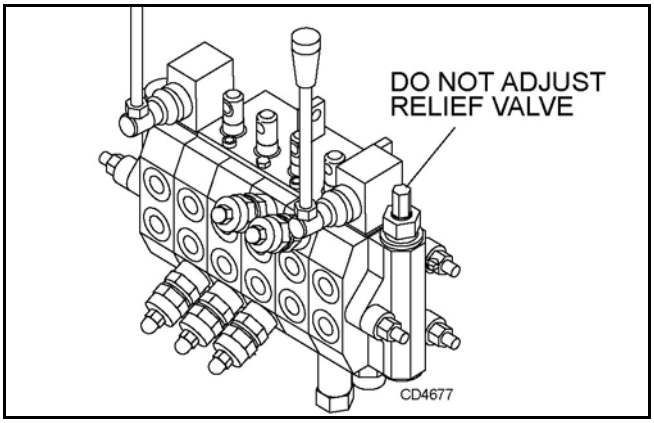


Figure 11. Relief Valve, BH80-X

LUBRICATION

⚠ WARNING

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

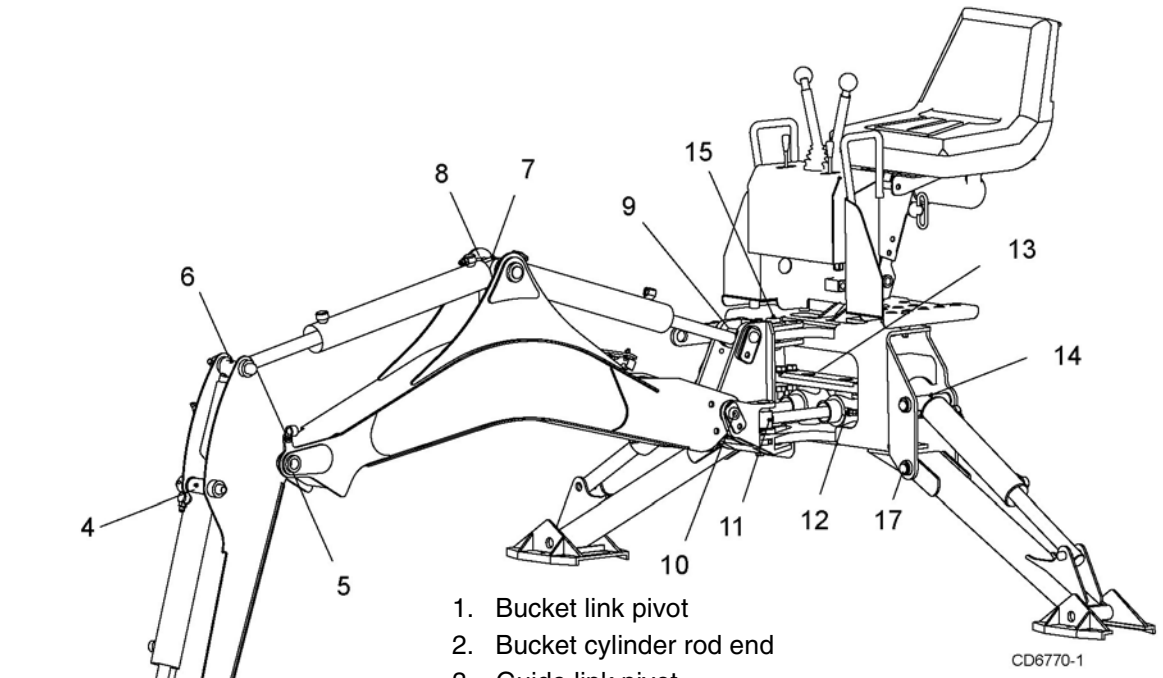
Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

Figure 12 shows lubrication points for the backhoe.

It is recommended that all fittings be lubricated daily or every eight hours of operation. In very wet or dry conditions, lubricate every four hours of operation.

Use an SAE multi-purpose type grease for all locations shown unless otherwise specified. Be sure to clean fitting thoroughly before using grease gun. One good pump of most guns is sufficient.

Position backhoe for easy lubrication by placing boom and dipper at 90° to each other with bucket cutting edge vertical and teeth resting on ground. Lower stabilizers to lubricate cylinders.



1. Bucket link pivot
2. Bucket cylinder rod end
3. Guide link pivot
4. Bucket cylinder base end
5. Dipper pivot
6. Dipper cylinder rod end
7. Boom cylinder base end, (2 - places)
8. Dipper cylinder base end
9. Boom cylinder rod end
10. Boom pivot
11. Swing cylinder, (right & left)
12. Swing cylinder pivot, (right & left on bottom)
13. Trunnion pivot plate (right & left)
14. Stabilizer cylinder base end (right & left)
15. Swing frame pivot (top & bottom)
16. Bucket pivot
17. Stabilizer pivot

Figure 12. Lubrication Points

OPTIONAL HYDRAULIC PUMP SYSTEM

Daily, check the fluid level in reservoir with filler cap dipstick. Contamination will shorten the life of hydraulic system components. Change oil and filter after first 20 hours of operation and then every 200 hours of operation or annually, whichever occurs first. In extremely dusty or dry conditions, more frequent changes may be necessary. System capacity is approximately 5-1/2 to 6 U.S. gallons.

Drain the oil into a suitable container and dispose of properly in a manner compatible with the environment.

IMPORTANT

■ **Fill with clean oil. Do not mix oil types or grades.**

ENGAGE PTO AND RUN AT IDLE FOR 5 MINUTES, THEN CHECK OIL LEVEL. Add fluid as necessary.

Recommended Oils and Temperature Ranges
Do not mix oil grades or types

SAE Hydraulic Transmission Fluid	All Temperatures
Type “A” or “F” ATF	All Temperatures
SAE 30-30W	90° F and above
SAE 20-20W	35° - 90° F
ASAE 10-10W	35° F and below

CLEANING

After Each Use

- Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Inspect machine and replace worn or damaged parts.
- Replace any safety decals that are missing or not readable.

Periodically or Before Extended Storage

- Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Remove the remainder using a low-pressure water spray.
  1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
  2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
  3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.
- Inspect machine and replace worn or damaged parts.
- Sand down scratches and the edges of areas of missing paint and coat with Woods spray paint of matching color (purchase from your Woods dealer).
- Replace any safety decals that are missing or not readable (supplied free by your Woods dealer). See Safety Decals section for location drawing.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Noisy pump caused by cavitation	Oil too heavy	Change to proper viscosity
	Oil filter plugged	Replace filter
	Suction line plugged or too small	Clean line and check for size
	Suction line kinked	Replace line
Oil heating	Oil supply low	Fill reservoir
	Contaminated oil	Drain reservoir, change filter, and refill with clean oil
	Setting of relief valve too high or too low	Set to correct pressure
	Pump operating too fast	Do not exceed 540 rpm PTO speed
Shaft seal leakage	Worn shaft seal	Replace shaft seal
Foaming oil	Low oil level	Fill reservoir
	Air leaking into suction line	Tighten fittings
	Wrong kind of oil	Drain and refill reservoir with non-foaming oil
	Moisture in oil	Keep oil temperature below 180° and continue to operate as oil dries out, or replace oil and purge system if foaming is excessive
Boom drops as dipper or bucket cylinder lever is activated while boom control is in raised position	Load check valve leaking	Clean or replace check valve assembly
Jerky operation	Hydraulic hoses plumbed incorrectly	Check hydraulic plumbing schematic and correct hose routing as required

DEALER SERVICE

The information in this section is written for dealer service personnel. The repair described here requires special skills and tools. If your shop is not properly equipped or your mechanics are not properly trained in this type of repair, it may be more time and cost effective to replace complete assemblies.

⚠ WARNING

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before maintenance, service, or disconnecting any hydraulic lines.**

⚠ CAUTION

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

BH70-X

HYDRAULIC VALVE REPAIR

Refer to Figure 13.

Valve repair should be accomplished in a clean work place. Note the configuration of the parts before disassembling valve and control linkage. This will make reassembly easier.

System Relief Valve

⚠ WARNING

■ **Adjustment of system relief pressure must be done by a qualified, experienced dealership. Incorrect adjustment can result in system failures and serious personal injury.**

No individual parts are available for relief valve. Replace entire assembly if required.

Pressure Setting Adjustment

NOTE: Before changing the pressure setting on the valve, determine tractor hydraulic system pressure. Many tractors do not create 2000 psi. If your tractor does not create 2000 psi, changing the relief valve setting will not improve the backhoe performance.

To adjust relief valve setting, place a 3000 psi pressure gauge in the line attached to the valve inlet (IN) port. Remove cap from top of main relief (1, Figure 13). Turn adjusting screw clockwise to increase pressure and counter clockwise to decrease pressure. Start tractor and set throttle for full engine speed. Move right stabilizer control lever to raise stabilizer to transport position and hold the lever so full pressure builds. Adjust screw to attain 2000 psi. Shut off tractor and replace cap.

Port Relief Valves

Pressure settings on port relief valves are preset at the factory. Although they are adjustable, they must not be reset in the field using backhoe hydraulic system. An incorrect setting could cause hydraulic pump to fail or backhoe cylinder rods to buckle.

Replace Port Relief Valves

It is not necessary to remove the entire valve assembly from the console to replace individual port relief valves. Be sure to install valve cartridges set at the correct pressure. Valves are similar and can be easily mixed up.

NOTE: Valve cartridges have small sealing washers attached to them. When replacing valve, check cavity in valve housing for any loose washers.

Port Relief Valve	Pressure Setting
Cartridge 2	2470 psi
Cartridge 3	2610 psi

Load Check Valve Replacement

The load check valves (4) are located between the valve work ports. Remove load check assembly using

a large screwdriver. Inspect seat in valve housing for any dirt or damage. Replace load check if required.

Spool Repair

Whenever repairing spools or positioner, replace valve spool seals which are included in the spool seal repair kit.

Disassemble

Remove the joystick assembly and/or single lever control from valve. Remove the plastic dust cap from positioner (5, 6). Unscrew the positioner assembly from valve housing. Push spool (7, 8) out of housing.

Secure spool in vise taking care not to scratch or nick the outer surface. Unscrew the positioner from spool. Remove brass sleeve (9) and O-ring (10) from positioner end of valve housing. Remove O-ring (10) and flange washer (11) from control lever end of valve housing. The boom spool has a special sleeve with two O-rings.

Check spools, replace if nicked and scratched.

Carefully inspect spool bore in valve housing. If deep scratches or scouring is present, entire valve should be replaced.

Assemble

Clean threads on positioner and spool. Apply a removable-type thread locking compound to male threads and assemble positioner to spool. Torque to 85±15 in-lbs.

Apply clean oil to O-ring (10) and install, along with brass sleeve (9) on spool housing positioner end. Slide spool into valve housing. Torque positioner end cap (5, 6) to 70±15 in-lbs.

Reassemble the O-ring (10) and flanged washer (11) on control lever end of spool. Boom spool does not use a flange washer.

Position spool wipers (A) (Figure 13) on swing, dipper, and bucket spools in linkage plate. Reinstall control linkage. Note the screws installed in the boom and dipper spools should be tightened until snug, then backed off approximately ½ turn to allow free movement of the joystick.

1. System relief valve 2030 psi
2. Port relief valve with anti cavitation check 2470 psi
3. Port relief valve 2610 psi
4. Load check valve
5. Positioner, 4-position with float
6. Positioner, 3-position
7. Spool, 4-position float (1)
8 Spool, 3-position (5)
9. Sleeve, lower
10. O-ring
11. Flange washer (5)
12. Sleeve, boom spool (1)

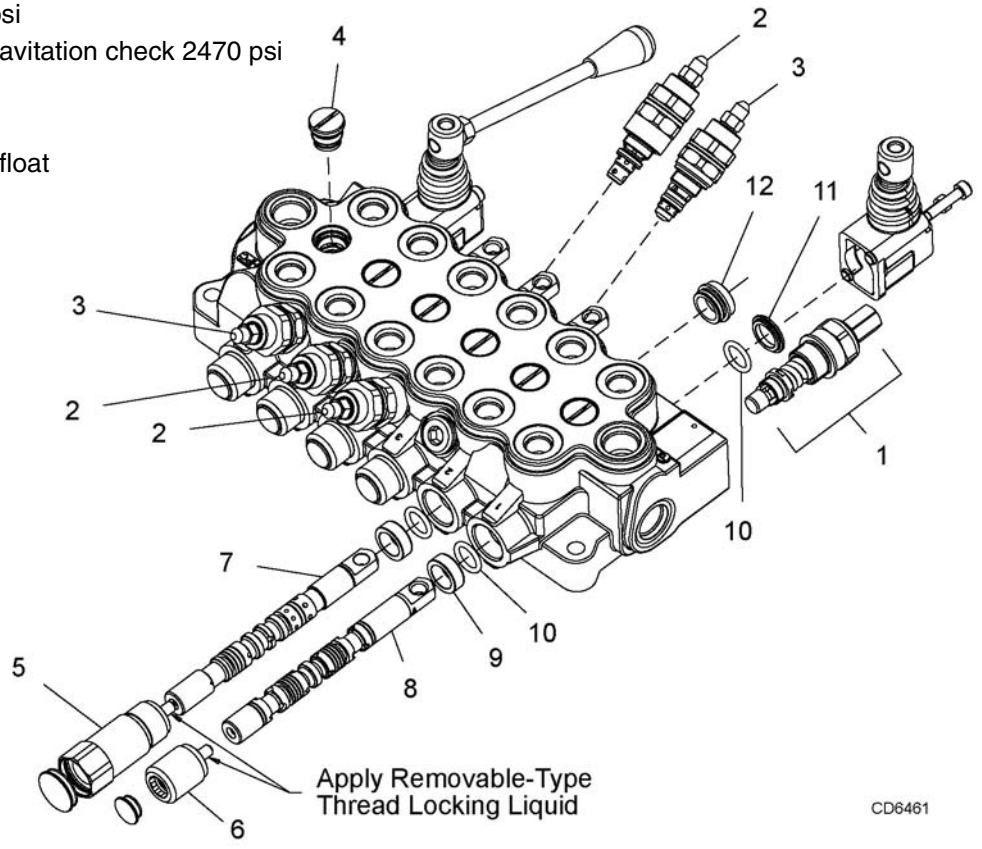


Figure 13. BH70-X Control Valve Assembly

ADJUST CONTROL VALVE LINKAGE

Reconnect control linkage to valve.

Control handles should be positioned as shown.

When completing a maintenance function on the valve, perform a functional test by placing control handles in their various positions and make certain the correct operation occurs corresponding to the decals on the operator's console. Pay specific attention to the float position of the boom. Do not operate backhoe if functions differ from the decal.

If the functions differ from the decal, check to make sure control linkage is correctly installed and check plumbing schematics to make sure hoses are correctly connected.

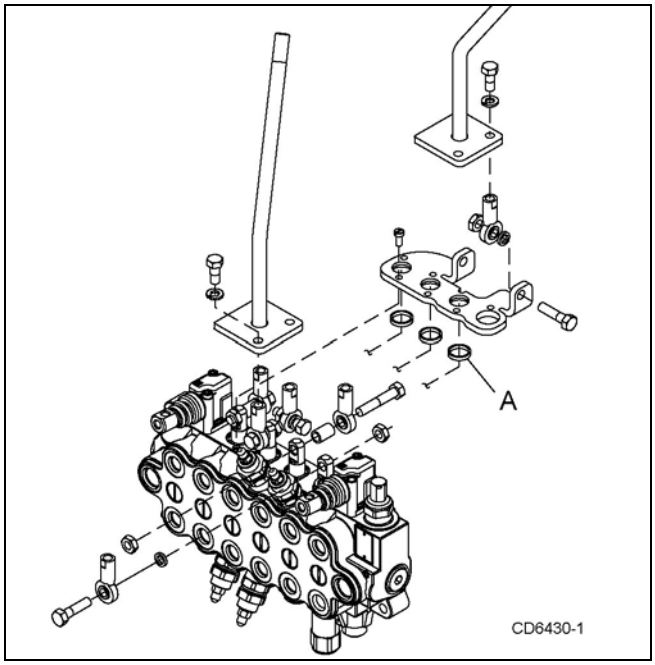


Figure 14. Control Lever Adjustment

BH80-X

HYDRAULIC VALVE REPAIR

Refer to Figure 15.

Valve repair should be accomplished in a clean work place. Individual components for many of the assemblies are not available as repair parts. This will simplify repair and allow you to replace complete assemblies.

Pressure Settings on Port Relief Valves

Pressure settings on port relief valves are pre-set at the factory. Although they are adjustable, they must not be reset in the field using backhoe hydraulic system. The backhoe pump will separate or crack if system pressure exceeds the maximum.

Relief valve adjustment requires a test bench and accurate gauges.

Adjusting System Relief Valve Pressure

⚠ WARNING

■ **Adjustment of system relief pressure must be done by a qualified, experienced dealership. Incorrect adjustment can result in system failures and serious personal injury.**

NOTE: Before changing the pressure setting on the valve, determine tractor hydraulic system pressure. Many tractors do not create 2000 psi. If your tractor does not create 2000 psi, changing the relief valve setting will not improve the backhoe performance.

Place a pressure gauge in the pump pressure line at the relief valve. When installing pressure gauge, be sure to use steel fittings that will withstand working pressure up to 5000 psi.

Remove cap nut (6a). Adjusting screw (6c) has a hex socket - rotate screw clockwise to increase pressure and counter-clockwise to decrease pressure.

Start tractor and engage PTO (for pump kits) set throttle at PTO speed. Set system relief valve pressure at 2470 psi. When pressure is adjusted, shut tractor PTO and tractor off. Replace cap nut (6a) on system valve.

Replacing Port Relief Valves

It is not necessary to remove valve from console to replace port relief valve cartridges. Remove console cover and replace them. Be sure you install valve cartridges set at the correct pressure. Valves are similar and can be easily mixed up.

Port Relief Valve	Pressure Setting
4AA	2470 psi
4BB	2610 psi

Segment Replacement

Relieve system pressure and remove valve from backhoe. Remove tie rods and separate the valve sections.

Replace defective sections as necessary. Make sure you install two spacers between each section of each tie rod. Note the location of O-rings (9 & 10). They must be placed in the location between valve sections as shown in Figure 15.

When assembling valve sections, use care when torquing nuts on tie rods. This must be done in steps - that is to say, gradually increasing the tightening torque up to

13 lbs-ft. in an alternating sequence. Non-uniform or excessive tightening can cause binding of spools. Failure to attain the proper torque can result in leaks. Always use a torque wrench.

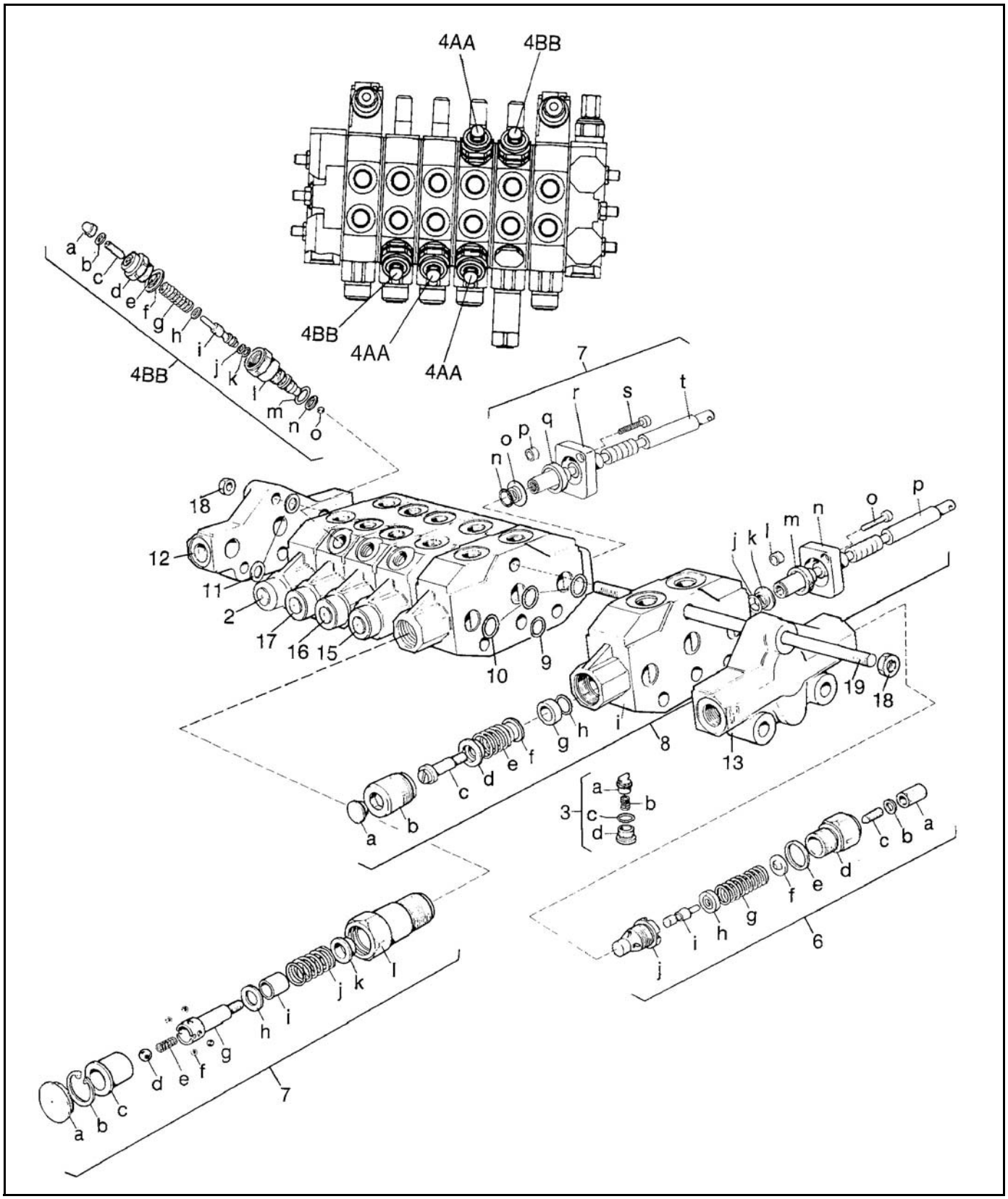


Figure 15. BH80-X Control Valve Assembly

1. Complete hydraulic valve
2. Left stabilizer segment
3. Check valve assembly
   a. Poppet
   b. Spring
   c. Seal
   d. Car plug

4AA. Shock/dampening valve, 2470 psi

4BB. Shock/dampening valve, 2610 psi
   a. Cap nut
   b. Washer
   c. Adjusting screw
   d. Retainer
   e. Rear spring washer
   f. Copper washer
   g. Spring for relief valve
   h. Front spring washer
   i. Valve poppet
   j. Back-up ring
   k. Seal
   l. Valve seat
   m. Back-up ring
   n. Washer
   o. Ball, Dia. 5

6. 1350 - 3000 Psi Relief valve assembly
   a. Cap nut
   b. Copper washer
   c. Adjusting screw
   d. Retainer
   e. Copper washer
   f. Rear spring washer
   g. Spring
   h. Front spring washer
   i. Valve poppet
   j. Valve seat

7. Spool position control 04 assembly
   a. Plug for 04 positioner
   b. Snap ring
   c. Bushing for 04 positioner
   d. Ball
   e. Spring
   f. Ball
   g. Connecting bolt
   h. Washer
   i. Spacer
   j. Spring for 04 positioner
   k. Spring flange
   l. Housing
   n. O-ring
   o. Flanged washer
   p. Dowel bushing
   q. Scraper
   r. Lever bracket
   s. Cap screw
   t. Spool

8. Right stabilizer segment complete
   a. Plug
   b. Housing
   c. Connecting bolt
   d. Spring cap
   e. Spring
   f. Spring cap
   g. Spacer
   h. O-ring
   i. Valve segment
   j. O-ring
   k. Flanged washer
   l. Dowel bushing
   m. Scraper
   n. Lever bracket
   o. Cap screw
   p. Spool
9. Seal
10. Seal
11. Spacer
12. Standard exhaust section
13. Front port inlet section
14. Boom segment
15. Swing segment
16. Dipper segment
17. Bucket segment
18. Nut
19. Tie rod

CONTROL VALVE LINKAGE ADJUSTMENT

Reconnect control linkage to valve.

Control handles should be positioned with console as shown.

When completing a maintenance function on the valve, perform a functional test by placing control handles in their various positions and make certain the correct operation occurs corresponding to the decals on the operator's console. Pay specific attention to the float position of the boom. Do not operate backhoe if functions differ from the decal.

If the functions differ from the decal, check to make sure control linkage is correctly installed and check plumbing schematics to make sure hoses are correctly connected.

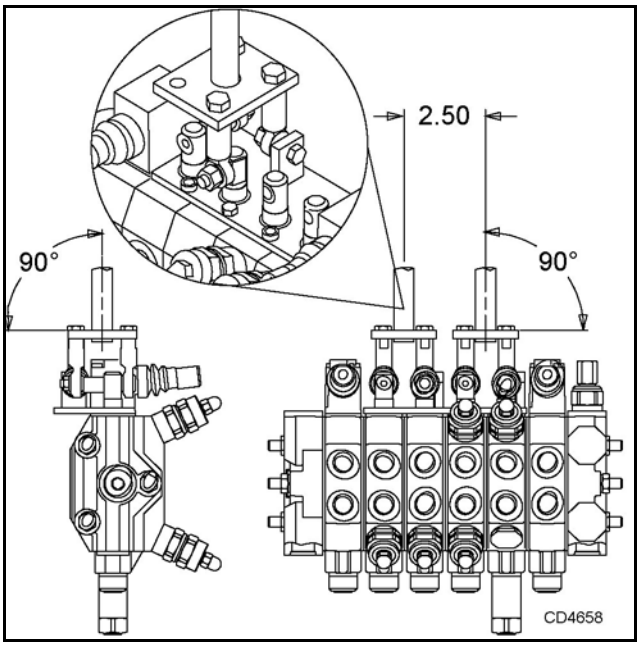


Figure 16. Control Lever Adjustment

HYDRAULIC CYLINDER REPAIR

General Hydraulic Repair Information

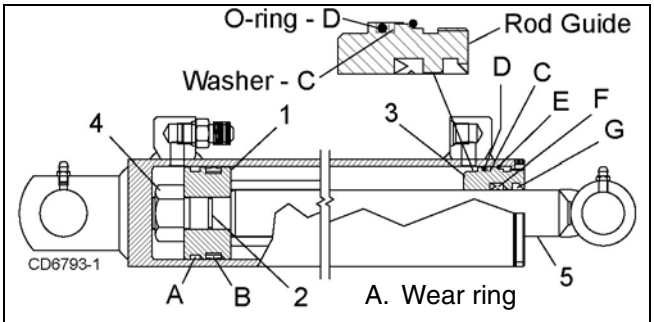
The only repair parts available for these cylinders are seal kits. If damage occurs to one of the cylinder components, replace the cylinder.

NOTE: Before ordering seal kits, check stamping on barrel. Part numbers ending with either "E" or "J" require specific seal kits. See parts page 45 for correct seal kit number.

A clean working area is essential for any hydraulic repair.

All parts must be carefully cleaned before reassembly. We recommend that when repairing hydraulic components, you always replace existing seals with new ones. Clean all components in solvent and blow dry with low pressure air.

Spanner Nut with Round Retaining Ring Style Rod Guide



1. Piston
2. Piston O-ring
3. Rod guide
4. Nut
5. Rod

A. Wear ring
B. Piston seal
C. Backup washer
D. O-ring
E. Retaining ring
F. Rod guide seal
G. Wiper

Figure 17. Boom & Dipper Cylinder

Disassemble

On the 2-1/2" spanner nut type cylinders, Figure 17, unscrew spanner nut from the end of the cylinder using a spanner wrench, or carefully use a punch and hammer.

Tap rod guide (3) into barrel about 1/2". Remove round retaining ring (E). Pull rod (5) from end of barrel.

Clamp cross pin end of rod assembly in a vise with protective jaws. Remove nut (4) from rod assembly. Remove piston (1) and rod guide (3) from rod.

Remove and discard all seals, wear rings and O-rings. Clean all components in solvent and blow dry with low pressure air.

Inspect inside of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Assemble

Lubricate O-rings and seals with clean hydraulic fluid. Install O-ring (D) and back-up washer (C) in exterior groove of rod guide (3). Note the position of the backup washer and O-ring. Install rod seal (F) into inner groove of rod guide with open portion of V-groove toward piston.

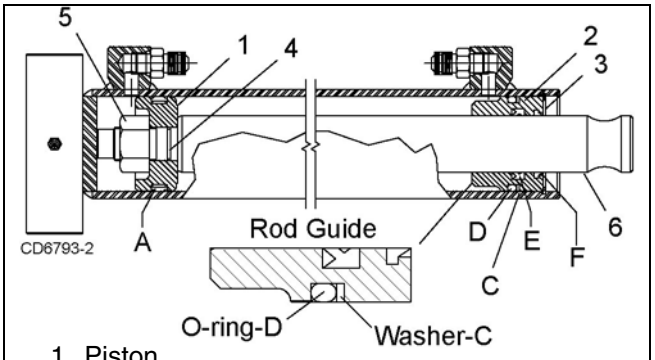
Place rod wiper (G) in inner rod guide groove. Slide rod guide assembly (3) onto rod (5). Place piston O-ring (2) in groove. Install wear ring (A) and seal (B) on out side of piston.

Slide piston onto rod. Apply Loctite®[1] primer 7649 and removable thread lock 242 to end of rod. Install nut (4) and torque to 150-180 lbs-ft.

Carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing.

Carefully push or tap rod guide (3) into barrel just past groove inside barrel. Insert retaining ring (E) into groove and pull rod (5) to seat rod guide (3) against ring. Apply Loctite 242 to threads on guide. Screw spanner nut onto guide using a spanner wrench, or carefully use a punch and hammer.

Snap Ring Style Rod Guide



1. Piston
2. Rod guide
3. Snap ring
4. Piston O-ring
5. Nut
6. Rod

A. Piston seal
C. Backup washer
D. O-ring
E. Rod guide seal
F. Wiper

Figure 18. Bucket & Stabilizer Cylinder

1. Loctite is a registered trademark of the Henkel Loctite Corporation.

Disassemble

Remove snap ring (3) from end of barrel. Slide rod assembly out of barrel. Inspect inside of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Clamp cross pin end of rod assembly in vise. Remove nut (5). Remove piston (1) and rod guide (2) from rod assembly. Clean threads on rod assembly and nut. Remove and discard all seals, wipers and O-rings.

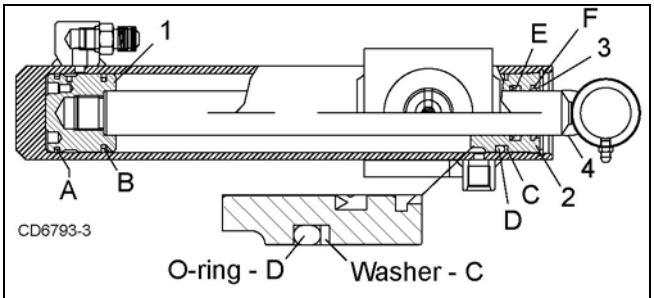
Assemble

Lubricate new seals with clean oil. Install O-ring (D) and backup washer (C) in the outer groove of rod guide (2). Note the position of the backup ring. Install rod seal (E) in inner groove of rod guide. Note that the lips of the seal should be toward the piston side of the guide. Install wiper (F) with lip pointed outward from rod guide. Slide rod guide onto rod (6).

Install seal (A) onto outer groove of piston. Apply oil to threads on rod assembly. Slide O-ring (4) over threads. Install piston. Apply Loctite primer 7649 and removable thread lock 242 to end of rod. Torque nut (5) to 150-180 lbs-ft.

Lubricate seals, slide rod assembly into tube and install snap ring (3) to complete assembly.

Swing Cylinder



1. Piston
2. Rod guide
3. Snap ring
4. Rod

A. Iron ring
B. Piston seal
C. Backup washer
D. O-ring
E. Rod seal
F. Wiper

Figure 19. Swing Cylinder

Disassemble

Check for style of rod guide and follow instructions in corresponding section. Slide rod assembly out of barrel. Inspect inside of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Clamp cross pin end of rod assembly in vise. Remove piston (1) from end of rod (4) using a spanner wrench. Slide rod guide (2) from rod. Clean threads on rod assembly and piston. Remove iron ring (A) from piston. Remove and discard all seals, wipers and O-rings.

Assemble

Lubricate O-rings and seals with clean hydraulic fluid. Install O-ring (D) and back-up (C) in exterior groove of rod guide (2). Note the position of the backup washer and O-ring. Install seal (E) and wiper (F) into inner grooves of rod guide with open portion of V-groove toward piston.

Slide rod guide assembly (2) onto rod (4). Place iron ring (A) in outer groove of piston. Install piston seal (B) in outer groove of piston.

Apply Loctite primer 7649 and removable thread lock 242 to threads on end of rod (4). Install piston (1) onto rod and tighten with a spanner wrench. Torque to 150-175 lbs-ft.

Compress iron ring and piston seal and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing.

Carefully push or tap rod guide (2) into barrel just past groove inside barrel. Secure rod guide as shown for the corresponding style.

ASSEMBLY

GENERAL ASSEMBLY INSTRUCTIONS

Backhoe assembly is the responsibility of the WOODS dealer. The backhoe should be delivered to the owner completely assembled, lubricated and adjusted for normal operating conditions.

Set backhoe up as received from the factory with these instructions and illustrations.

The backhoe must only be mounted with a tractor 3-point hitch using WOODS 3-Point Mount kit or a WOODS sub-frame kit. See WOODS 3-Point Mount manual for mount installation instructions.

When mounting this backhoe on a tractor using a sub-frame mount, special assembly instructions (which are contained in another manual furnished with the sub-frame) apply to some of the assembly procedures.

The backhoe is shipped partially assembled. Assembly will be easier if components are aligned and loosely assembled before tightening hardware.

NOTE: References to right, left, forward and rearward directions are determined from the backhoe operator seat position facing rearward.

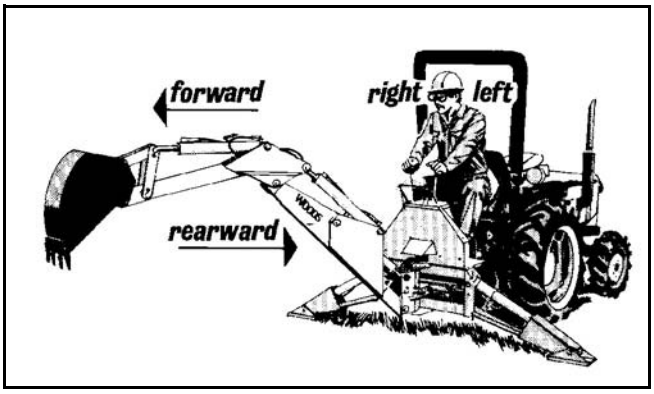


Figure 18. Backhoe Directions

⚠ WARNING

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

■ **Only mount this backhoe on Category 1 tractors with 800 lb. lift capacity at 24" behind 3-point lift arm hitch balls.**

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

⚠ WARNING

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

⚠ CAUTION

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

STABILIZER INSTALLATION

Remove stabilizer arms from pallet.

Remove pivot pins (27) from their shipping position. Attach stabilizer arm (20) to main frame (3) with pivot pin (27) and secure with snap ring (67).

Attach stabilizer cylinder (5) to stabilizer arm with pivot pin (25) and secure with two cotter pins (38).

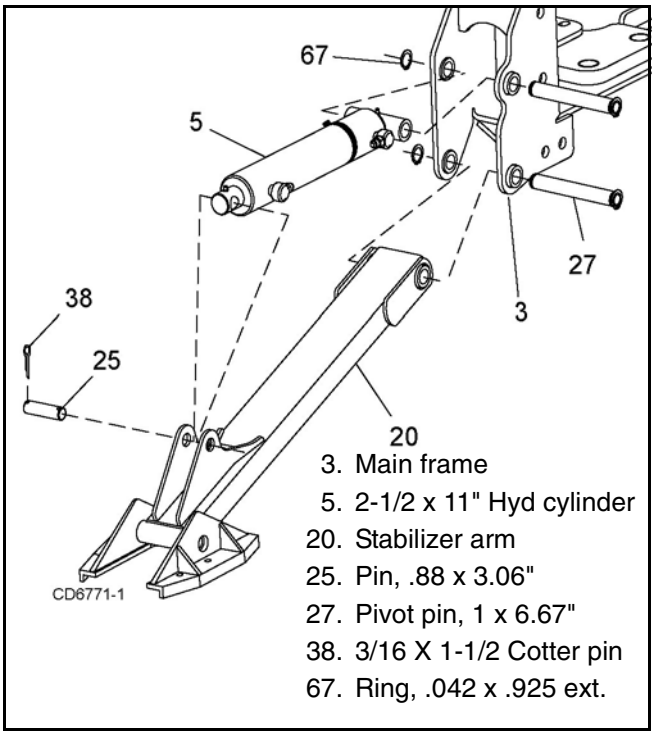


Figure 19. Stabilizer Arm Assembly - Left Side

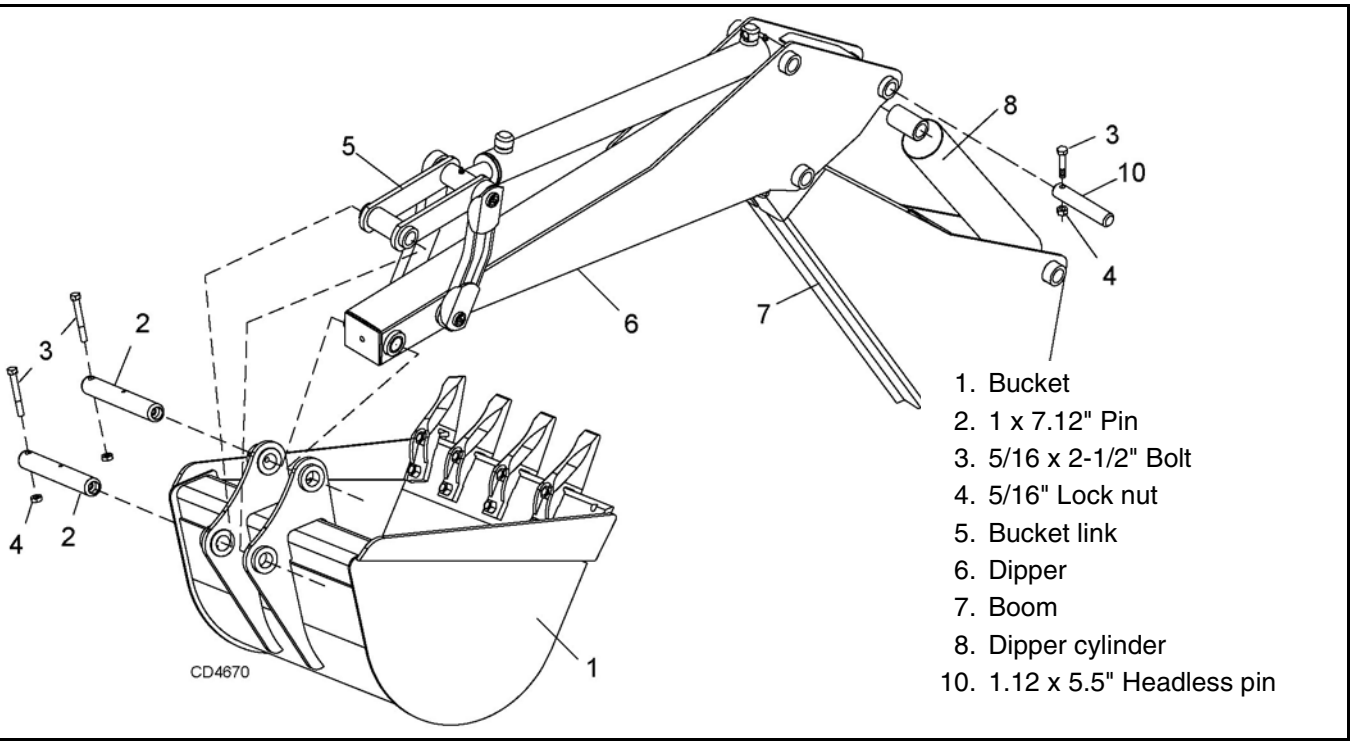


Figure 20. Dipper and Bucket Installation (Typical Assembly)

DIPPER CYLINDER INSTALLATION

Remove pivot pin (10) from end of dipper (6). Attach dipper cylinder (8) to dipper (6) with pivot pin and secure with bolt (3) and lock nut (4). Make sure hydraulic hoses are not twisted after boom and dipper are assembled.

BUCKET INSTALLATION

9", 12", 16", 18" and 24" buckets are available with this backhoe. Remove pivot pins (2) from end of bucket link (5) and dipper (6). Attach bucket (1) to bucket link and dipper with pivot pins (2) and secure with bolts (3) and lock nuts (4).

HYDRAULIC INSTALLATION

Refer to Figure 21.

⚠ WARNING

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

■ Make sure shields and guards are properly installed and in good condition. Replace if damaged.

Power to the backhoe can be supplied directly from the tractor hydraulic system. A hydraulic requirement of 5-7 gallons per minute and 2000 PSI (BH70-X) or 2400 psi (BH80-X) is necessary to operate the backhoe efficiently. 3/8" diameter hoses (SAE 100 R1 with 2500 PSI working pressure) should be used to connect the hydraulic source to the backhoe valve. These hoses must be long enough to allow ease of removal or attachment of backhoe. Hoses must include external shielding to prevent oil from spraying on operator if hose fails.

Open-Center

Refer to Figure 21.

Remove the console cover from the backhoe to gain access to control valve (1). Connect 3/8" hoses (2 & 3) to the backhoe inlet and outlet ports. Install couplers (4) compatible to the tractor on opposite end of the 3/8" hoses. Determine the direction of flow and connect tractor pressure hose (6) to the inlet side of the control valve (under left foot rest).

Note: The backhoe will not function if oil is routed backwards through the valve. Connect the tractor return hose (5) to the control valve outlet port. Tighten all fit-

tings securely. Start engine and run at low rpm. Activate hydraulic circuit and check for leaks.

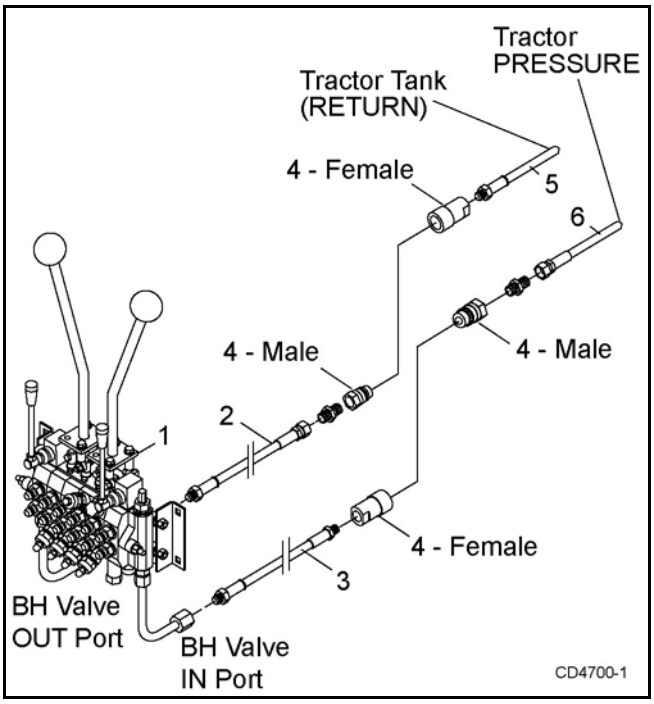


Figure 21. Open Center Hydraulic Plumbing

HYDRAULIC PUMP INSTALLATION (OPTIONAL)

Refer to Figure 22.

IMPORTANT

■ **Clean all fittings and use care to prevent foreign material from entering hydraulic system.**

NOTE: Use thread sealant on all pipe fittings.

Install hydraulic reservoir (1) to backhoe mainframe with carriage bolts (7) and flange lock nuts (8).

Attach elbow (3) to the outlet side of the filter assembly (4). Make sure elbow points downward. Attach adapter (6) and hose (23) to the inlet side of the filter assembly. Attach assembly to top of reservoir with elbow (3).

Install strainer (9), adapter (10), and elbow (11) to the OUT side of the reservoir.

Attach adapter (15) and elbow (14) to the inlet side of the hydraulic pump (16).

Attach hose (13) between elbows (14) and (11). Secure hose ends using hose clamps(12).

Install elbow (17) and hose (24) to the outlet side of the hydraulic pump.

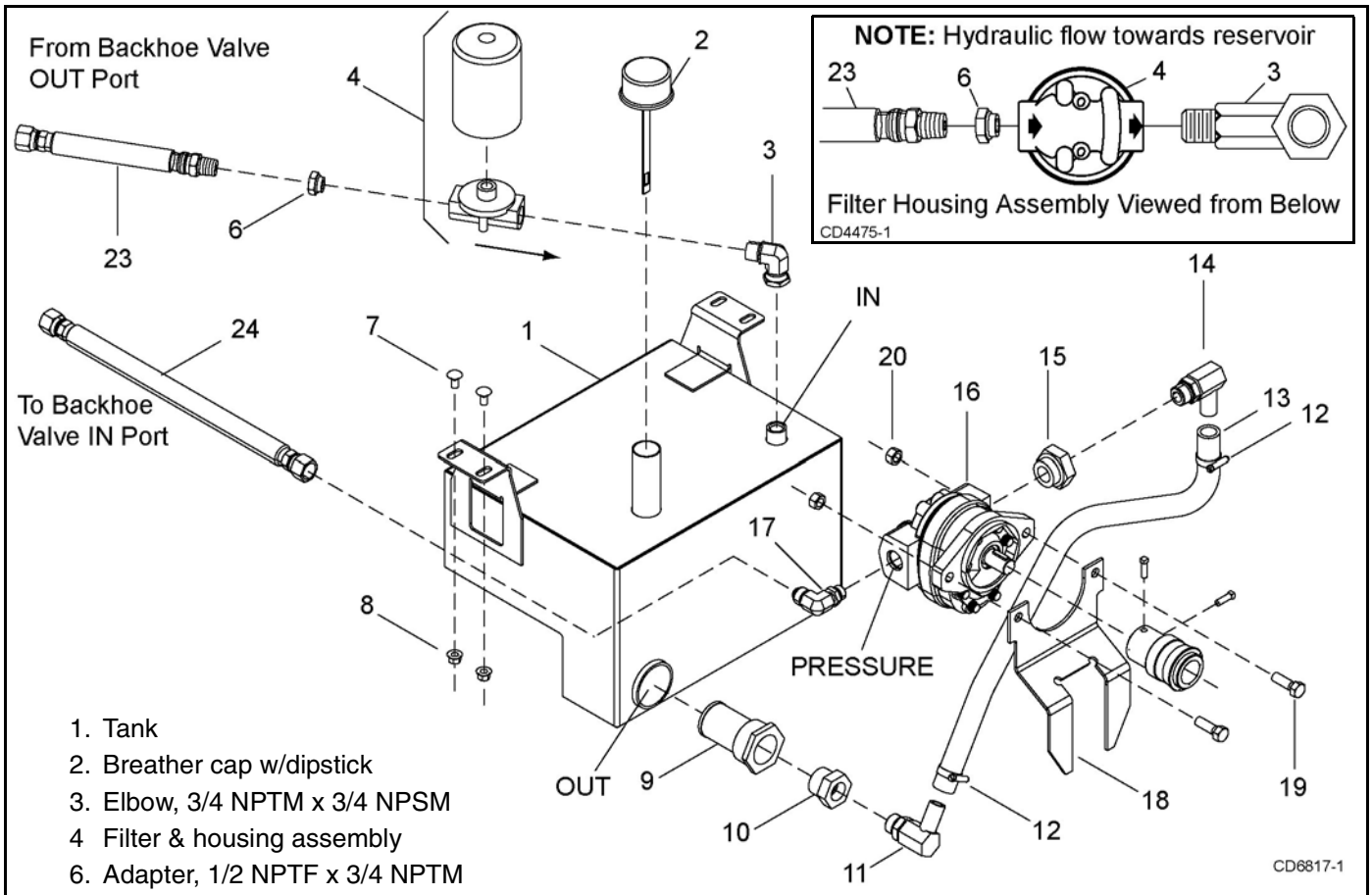
NOTE: To properly install hydraulic fittings with O-rings, completely loosen lock nut, screw fitting completely in, hold in position and tighten locknut using two wrenches.

Remove 90° steel tubes from the IN and OUT ports on the backhoe control valve.

Attach hose (23) to the backhoe control valve OUT port and hose (24) to the IN port.

Attach pump mounting bracket (18) to the hydraulic pump (16) using two cap screws (19) and lock nuts (20).

When backhoe is attached to tractor, it may be necessary to reposition filter and hoses to eliminate interference.



1. Tank
2. Breather cap w/dipstick
3. Elbow, 3/4 NPTM x 3/4 NPSM
4 Filter & housing assembly
6. Adapter, 1/2 NPTF x 3/4 NPTM
7. 3/8 NC x 3/4 Carriage bolt
8. 3/8 Flange lock nut
9. Tank strainer
10. Adapter, 1-1/4 NPTM x 3/4 NPTF
11. Elbow, 3/4 hose 90°
12. 1/2 Hose clamp
13. Hose, 3/4 x 36"
14. Fitting, 90°
15. Adapter, 1-1/16 ORBF x 1-5/8 ORBM
16. Pump
17. Elbow, 3/4 JICM x 1-1/6 NPTM 90°
18. Pump mounting bracket
19. 1/2 NC x 1-1/2 Cap screw GR5
20. 1/2 NC Lock nut
23. Hose, 30" x 3/4 JICF x 1/2 NPTM
24. Hose, 50" x 3/4 JICF x 3/4 JICF

Figure 22. Pump Installation

ATTACHING BACKHOE TO TRACTOR

Remove backhoe from pallet and position on level surface. Back tractor as near as possible and center on backhoe.

Remove seat and upper support before attaching backhoe to tractor.

Service optional hydraulic reservoir by filling to full mark on dipstick (approximately 5-1/2 to 6 US gallons). When backhoe is mounted and operated, it will be necessary to add more fluid to reservoir. Install cap (2).

IMPORTANT

■ **Fill with clean oil. Do not mix oil types or grades.**

Use type A or F Automatic Transmission Fluid, SAE Motor Oil or #303 Hydraulic Fluid.

Recommended Oils and Temperature Ranges (Do not mix oil grades or types)

SAE Hydraulic Transmission Fluid	All Temperatures
Type A or F ATF	All Temperatures
SAE 30-30W	90° F and above
SAE 20-20W	35° - 90° F
ASAE 10-10W	35° F and below

PUMP MOUNTING BRACKET INSTALLATION

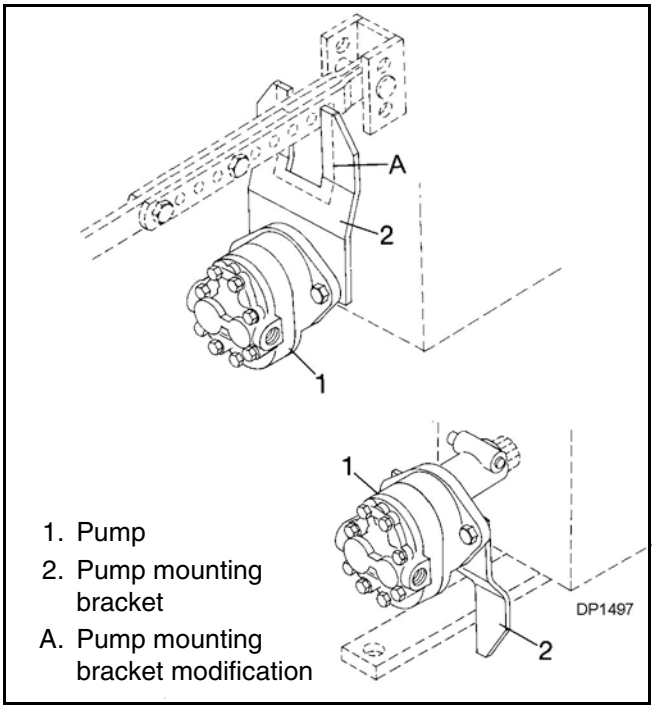
⚠ DANGER

■ **The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:**

- **Read Mounting Kit Manual instructions on attaching and removing backhoe and use extreme care.**
- **Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid being trapped should the boom swing control be accidentally activated.**

⚠ WARNING

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**



1. Pump
2. Pump mounting bracket

A. Pump mounting bracket modification

Figure 23. Pump Mounting Bracket Installation

If you are using a sub-frame mounting, refer to the pump mounting instructions provided with the sub-frame.

The pump mounting bracket is designed to slip over tractor drawbar. The best installation is to place bracket offset toward tractor and pump offset down; however, offset may be reversed if interference occurs, Figure 23.

On tractors with non-standard drawbars, it may be necessary to modify pump bracket by enlarging the opening. Bracket may also be inverted and retained on the top link bar. Whatever mounting is used, it is important that pump be restrained from rotating.

Attach pump mounting plate (18) to pump with bolts (19) and nuts (20), Figure 22.

Check all hydraulic fittings and lines to be sure they are tight and free of kinks and twists.

SEAT INSTALLATION AND ADJUSTMENT

The seat may be adjusted fore, aft, up and down for operator comfort. It is necessary to use the two adjustments together. Moving the seat down also moves it forward, moving it up also moves it rearward. The fore and aft adjustment may be used with the up and down adjustment to obtain desired position. Never operate the backhoe unless manufacturer's 3-point hitch Saf-T-Lok Limiter or sub-frame has been installed, adjusted and operator's area (shown in decal 1011992, see decal page 11) is free from obstructions.

INSTALL OPTIONAL STABILIZER STREET PAD

1. Attach two rubber stabilizer pads (7) to the bottom stabilizer pad (2) using three lock nuts (6).
2. Repeat step for opposite side stabilizer.

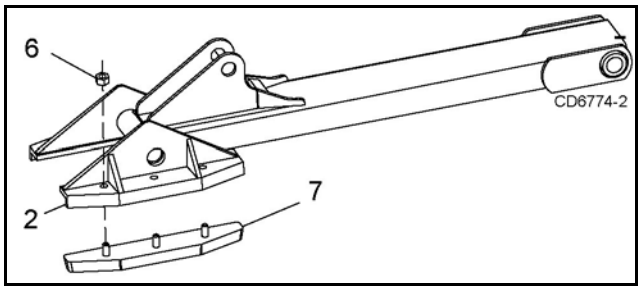


Figure 24. Stabilizer Pad Installation

OPTIONAL EQUIPMENT

1012552 3-Point Mount Kit

See 3-Point Mount Kit manual for installation instructions.

1015090 Mechanical Thumb (BH70-X)
1015100 Mechanical Thumb (BH80-X)

See Mechanical Thumb manual for Installation instructions.

DEALER CHECK LIST

PRE-DELIVERY CHECK LIST (DEALER'S RESPONSIBILITY)

Inspect the backhoe (and sub-frame when applicable) thoroughly after assembly to be certain it is set up properly before delivering it to the customer. The check lists are a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustments are made.

___ Check all bolts to be sure they are tight.

___ Check that all lubrication points have been lubricated.

___ Check that all cotter pins and safety pins are properly installed.

___ Properly attach backhoe (and sub-frame when applicable) to tractor and make all necessary adjustments.

___ Check that optional hydraulic reservoir has been serviced and that hydraulic system and all functions have been operated through full cylinder stroke to purge air from system.

___ Make sure all hydraulic fittings are tight and hoses are properly routed and not twisted, bent sharply, kinked or pulled tight.

___ After pressurizing and operating all backhoe functions, stop tractor and make sure there are no leaks in the hydraulic system. Follow all safety rules when checking for leaks.

DELIVERY CHECK LIST (DEALER'S RESPONSIBILITY)

___ Present Operator's Manual (and sub-frame manual when applicable) and request that customer and all operators read it before operating equipment.

___ Point out all safety features of the equipment. Explain the importance and meaning of all safety decals and emphasize the potential hazards when not followed.

___ Show customer how to make adjustments.

___ Explain importance of lubrication and show lubrication points to customer.

___ Show customer the safe and proper procedures to be used when mounting, dismounting and storing backhoe (and sub-frame when applicable).

___ If backhoe is mounted to tractor 3-point hitch, explain the importance of the Saf-T-Lok limiter. Point out (as shown in Operator's Manual) the correct attachment and adjustment of the limiter.

___ Point out the correct mounting of the hydraulic pump and routing of the hoses. Explain that during operation, mounting, dismounting and storage, care must be taken to prevent hose damage from pulling, twisting and kinking.

___ Show customer the safe and proper procedures to be used when mounting, dismounting and storing backhoe (and sub-frame when applicable).

NOTES

BH70-X and BH80-X

BH70-X & BH80-X MAIN FRAME ASSEMBLY 38
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DIPPER/BUCKET ASSEMBLY 41
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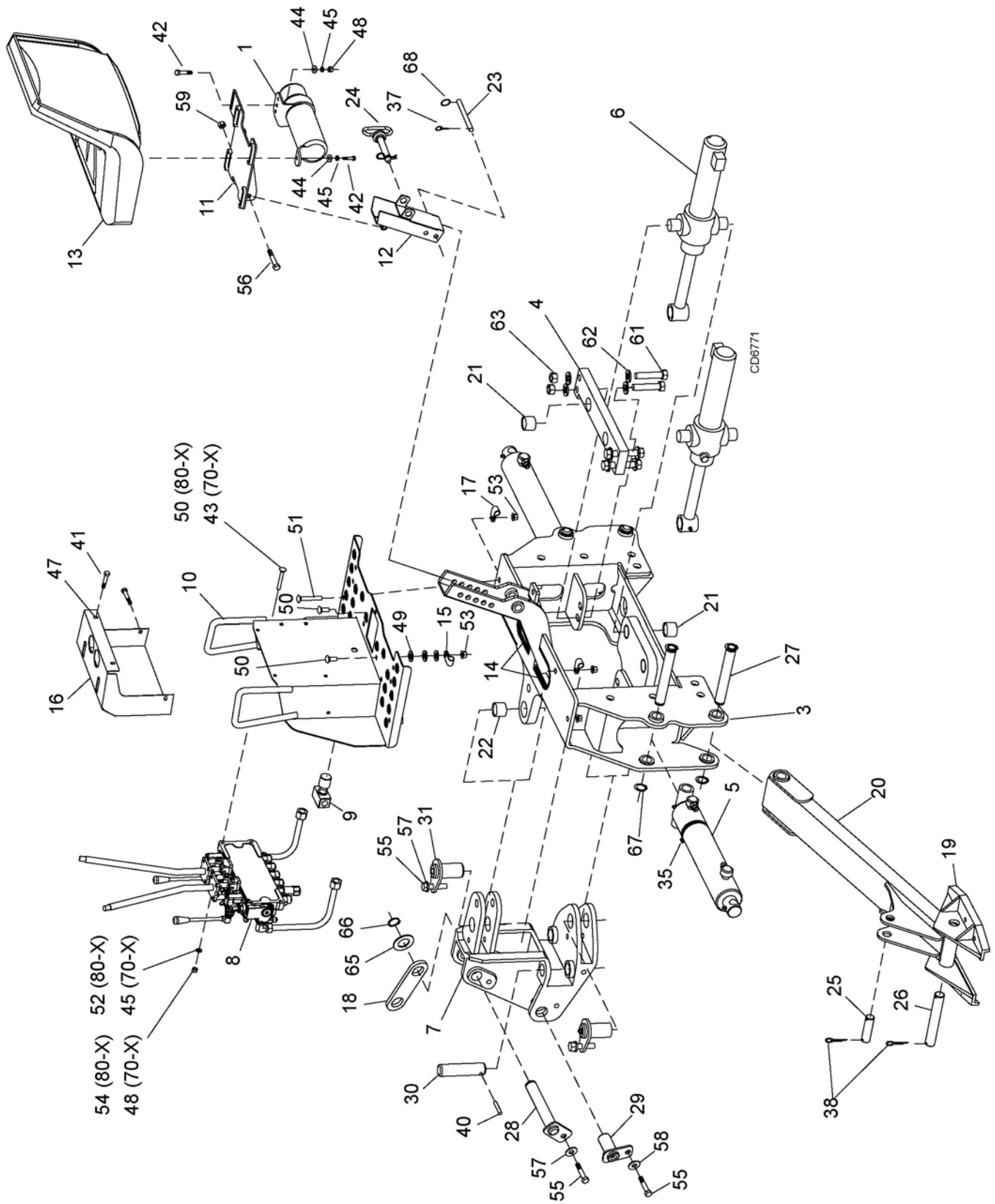
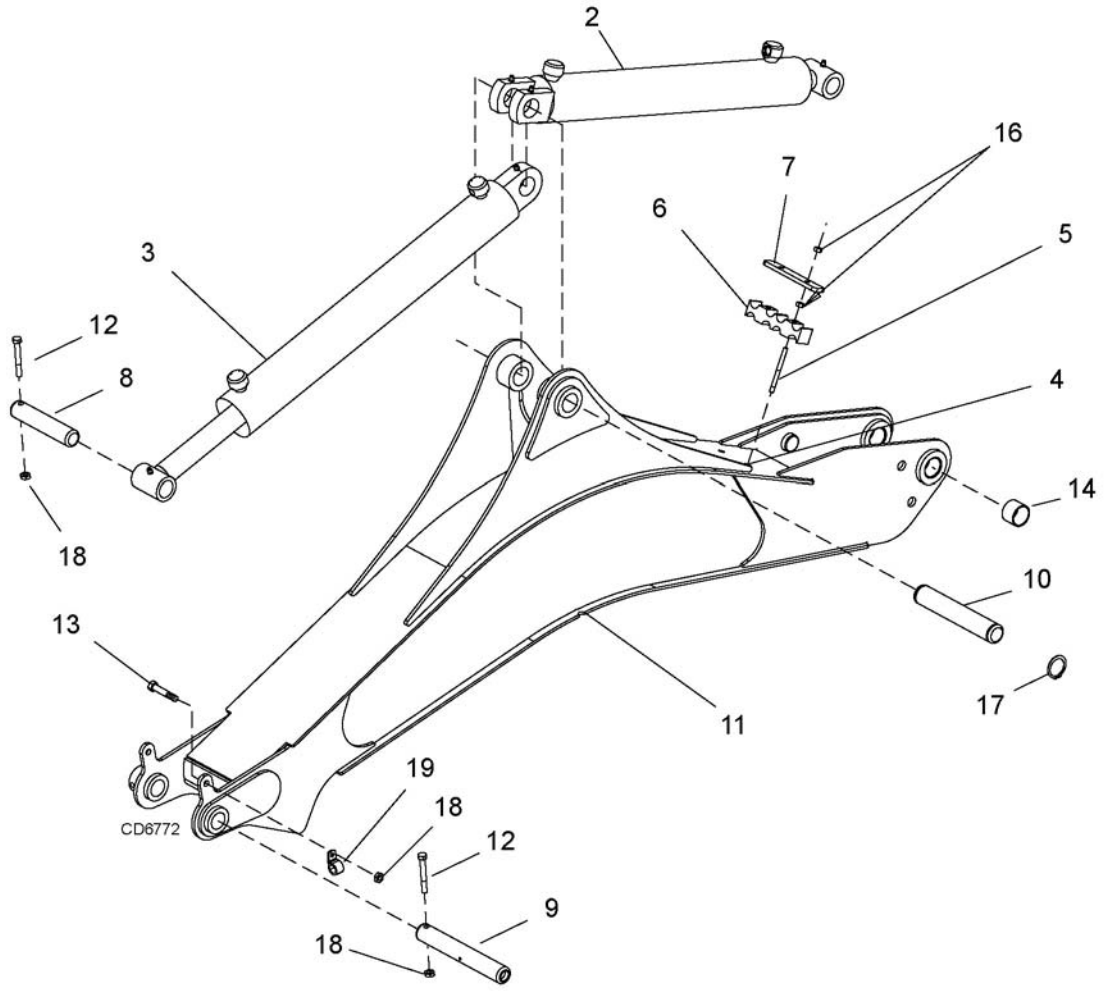
BH70-X, BH80-X MAIN FRAME ASSEMBLY



BH70-X, BH80-X MAIN FRAME ASSEMBLY PARTS LIST

REF	PART	QTY	DESCRIPTION
1	1003828	1	Manual tube
3	1011800	1	Main frame
4	1011821	1	Trunnion support bar (also order 2 of item 21)
5	1030003	2	Hydraulic cylinder, 2.5 x 1.5 x 11.0
6	1030005	2	Hydraulic cylinder, 2.0 x 1.125 x 9.0
7	1011836	1	Swing frame
8		1	Control valve assembly - see page 44
9	1012510	1	Flow control valve (BH80-X only)
10	1011957	1	Console (BH70-X)
10	1011958	1	Console (BH80-X)
11	1012563	1	Seat bracket
12	1012554	1	Seat mount
13	1012560	1	High back seat
14	1012562	2	Trim strip .38 x 9.6
15	35249	2	Clamp, 1/2 ID
16	1011847	1	Valve cover (BH70-X)
16	1011848	1	Valve cover (BH80-X)
17	74058	2	Clamp, steel cushion .625 dia
18	1011849	1	Lockup bar
19	1012514	2	Stabilizer pad
20	1012515	2	Stabilizer arm
21	37429	4	Bearing, 1.25 x 1.41 x 1.0
22	1011869	2	Bearing, 1.50 x 1.67 x 1.0
23	13817	1	Pin, .5 x 4.5
24	1012579	1	Pin, .75 x 4.0
25	1012546	2	Pin .88 x 3.06
26	53920	2	Pin, 1.0 x 5.84
27	1012529	4	Pin, 1.0 x 6.67
28	1011885	1	Pin 1.12 x 6.36
29	1011876	2	Pin 1.25 x 2.44
30	1011874	2	Pin, 1.25 x 5.0
31	1011870	2	Pin, 1.5 x 2.62
35	8641 *	2	14-1/2 Binding strap
37	22411	1	3/16 x 1 Klik pin
38	1266 *		3/16 x 1-1/2 Cotter pin
40	7251	2	5/16 x 2 Spring pin
41	78205 *	4	5/16 NC x 3/4 HHCS GR5
42	6250 *	5	5/16 x 1-1/4 HHCS GR5
43	1008291 *	3	5/16 NC x 2-1/2 Carriage bolt GR5 (BH70-X)
44	4378 *	5	5/16 Flat washer
45	2472 *	5	5/16 Lock washer
46	6778 *	4	5/16 NC Lock nut
47	74047	4	5/16 NC Spring nut
48	4529 *	3	5/16 Hex nut
49	565 *	6	3/8 Flat washer
50	6697 *	7	3/8 NC x 1.0 Carriage bolt
51	35735 *	4	3/8 NC x 2-1/2 Carriage bolt GR5
52	838 *	4	3/8 Lock washer
53	14350 *	5	3/8 NC Flange lock nut
54	835 *	4	3/8 NC Nut
55	25475 *	2	1/2 NC x 1 HHCS GR5 (full thread)
56	10380 *	1	1/2 NC x 4 HHCS GR5
57	57816	2	1/2 Hardened flat washer
58	1012568	2	1/2 Nord lock washer
59	765 *	1	1/2 NC Lock nut
61	12274 *	4	5/8 NC x 2-1/4 HHCS GR5
62	57817	8	5/8 Hardened flat washer
63	230 *	4	5/8 NC Hex nut
65	12272	1	Washer 1.12 x 2.38 x .19
66	1011837	1	Snap Ring for 1.12 shaft
67	62102	8	Snap ring for 1.00 shaft
68	62992	1	Split ring, .11 x 1.1 OD
70	1011956		Safety Decal Set
71	1011959		Complete Decal Set
72	1011973		French Safety Decal Set
			HHCS - Hex Head Cap Screw
		*	Standard hardware, obtain locally

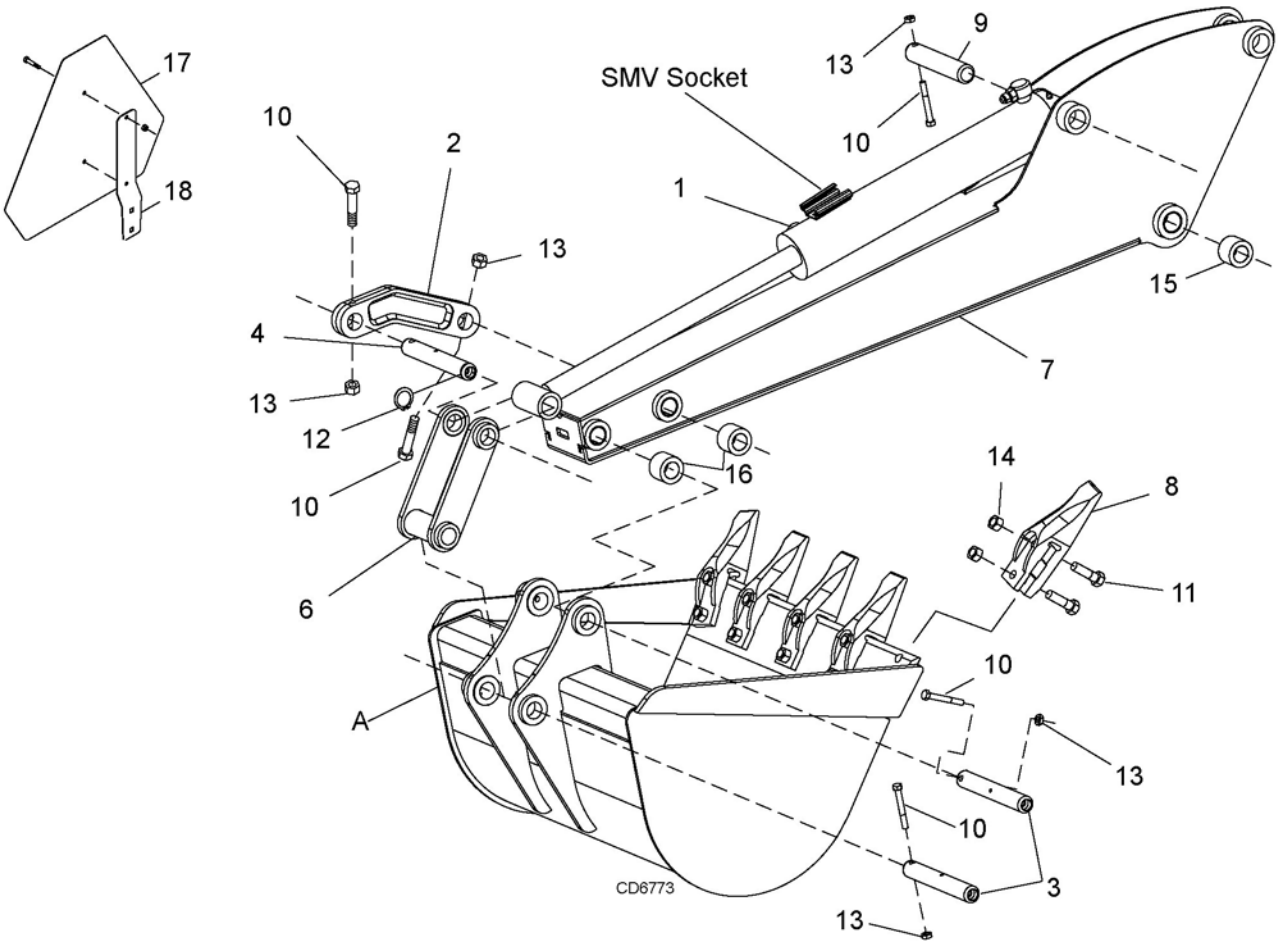
BH70-X, BH80-X BOOM ASSEMBLY



REF	PART	QTY	DESCRIPTION
2	1030006	1	Hydraulic cylinder 2.5 x 1.25 x 15.50 Retracted length 26.25" (BH80-X) **-or-**
2	1030009	1	Hydraulic cylinder 2.5 x 1.25 x 15.50 Retracted length 23.38" (BH70-X)
3	1030007	1	Hydraulic cylinder 2.5 x 1.38 x 19.38 (BH80-X) **-or-**
3	1030010	1	Hydraulic cylinder 2.5 x 1.25 x 16.75 (BH70-X)
4		1	1/4 NC Blind hole nut
5	1011842	1	1/4 NC x 3.0 Stud
6	1011843	1	Clamp, 8 Hose
7	1011844	1	Clamp, link
8	1011863	1	Pin, 1.12 x 5.5
9	1011882	1	Pin, 1.12 x 7.94
10	1011884	1	Pin, 1.25 x 6.79

REF	PART	QTY	DESCRIPTION
11	1011920	1	Boom (BH80-X) **-or-**
11	1011980	1	Boom (BH70-X)
12	10509 *	2	5/16 NC x 2-1/2 HHCS GR5
13	14562 *	2	5/16 NC x 1 HHCS GR5
14	37429	2	Bearing, 1.25 x 1.41 x 1.0
16	5288 *	2	1/4 NC Hex nut
17	63236	2	Retaining ring, .050 x 1.156
18	6778 *	3	5/16 NC Lock nut
19	74058	1	Clamp, steel cushion .625
			HHCS - Hex Head Cap Screw
		*	Standard hardware, obtain locally

BH70-X, BH80-X DIPPER/BUCKET ASSEMBLY



REF	PART	QTY	DESCRIPTION
A	1014209	1	Bucket, 9" **-or-**
	1014212	1	Bucket, 12" **-or-**
	1014216	1	Bucket, 16" **-or-**
	1014218	1	Bucket, 18" **-or-**
	1014224	1	Bucket, 24"
1	1030008	1	Hydraulic cylinder, 2.5 x 1.25 x 13.87
2	1011858	2	Guide link
3	1011864	2	Pin, 1.0 x 7.12
4	1011879	2	Pin, 1.0 x 7.0
6	1011895	1	Bucket link
7	1011970	1	Dipper, BH70-X **-or-**
7	1011970T	1	Dipper, BH70-X, (thumb ready)**-or-**
7	1011960	1	Dipper, BH80-X, (thumb ready)
8	1014202	A/R	Bucket tooth, 1.95 x 7.5 **-or-** (use 1/2" hardware)
8	D1070	A/R	Bucket tooth, 1.9375 x 7.5 (use 7/16" hardware)
9	1011883	1	Pin, 1.12 x 6.12

REF	PART	QTY	DESCRIPTION
10	10509 *	3	5/16 NC x 2-1/2 HHCS GR5
11	24576 *	2	1/2 NC x 1-3/4 HHCS GR5 (used w/bucket tooth 1014202) **-or-**
11	10978 *	2	7/16 NC x 1-3/4 HHCS GR5 (used w/bucket tooth D1070)
12	62102	2	Retaining ring, .042 x .925 external
13	6778 *	3	5/16 NC Lock nut
14	765 *	2	1/2 NC Lock nut (used w/bucket tooth 1014202) **-or-**
14	13921 *	2	7/16 NC Lock nut (used w/bucket tooth D1070)
15	1011868	2	Bushing, 1.12 x 1.50 (BH80-X)
16	1011867	2	Bushing, 1.00 x 1.50 (BH80-X)
17	24611	1	SMV sign (Slow Moving Vehicle)
18	1004251	1	SMV mounting bracket

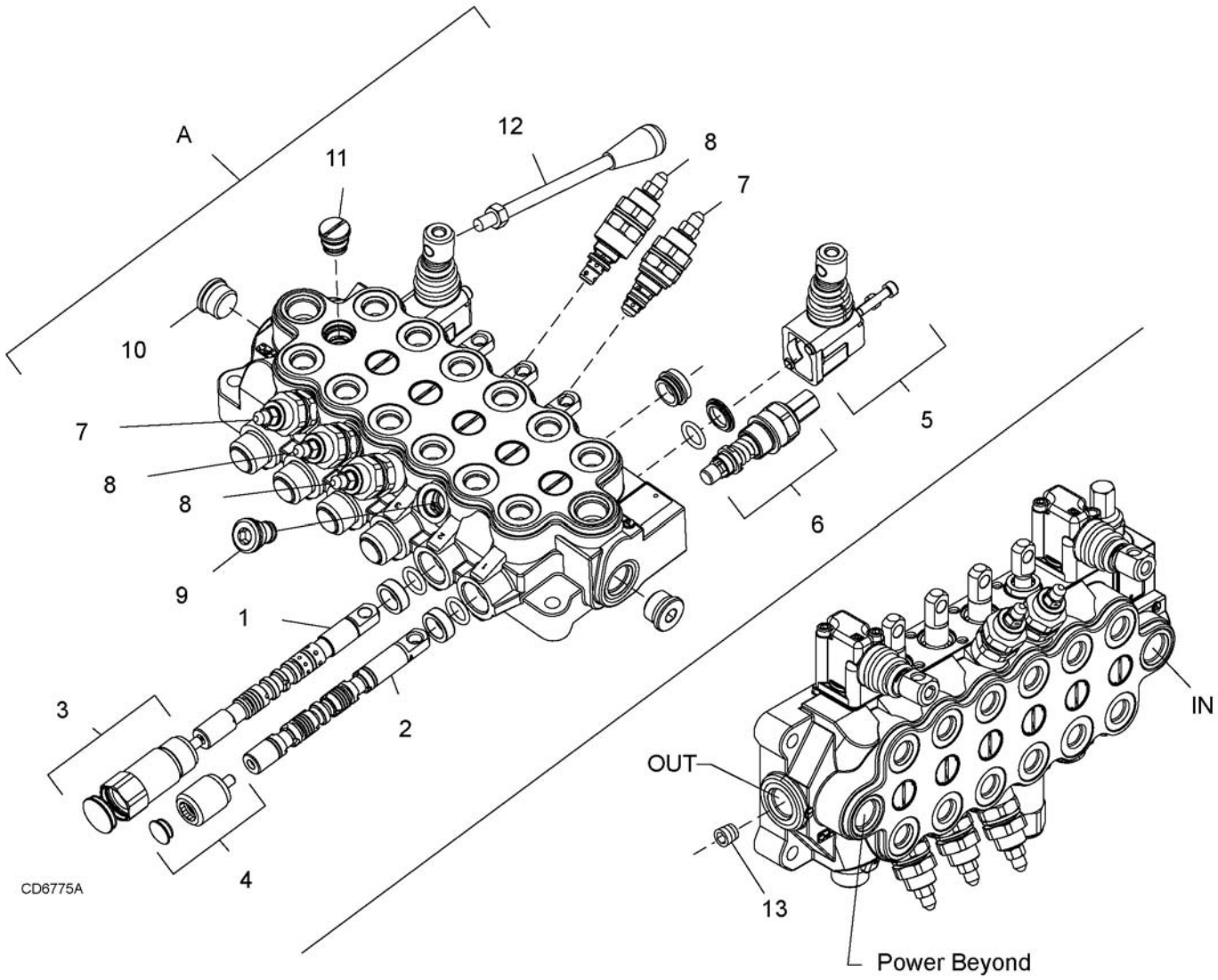
* Standard hardware, obtain locally

NS Not Shown

A/R As Required

HHCS - Hex Head Cap Screw

BH70-X CONTROL VALVE ASSEMBLY

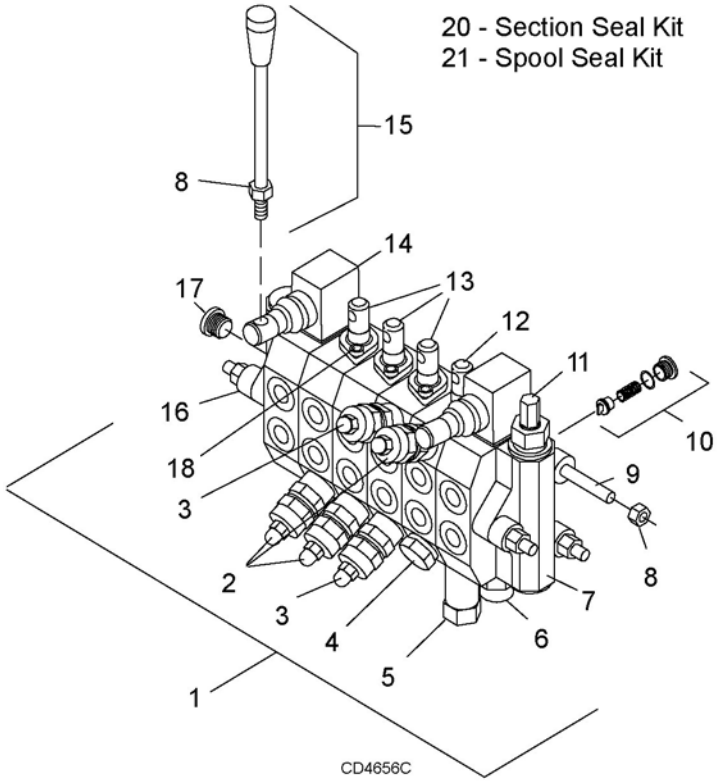


Port Function In Power Beyond Configuration

REF	PART	QTY	DESCRIPTION
A	1011951	1	6-Spool control valve 2030 psi MBLK
1	1011953	1	4-Position float spool
2	1011954	5	3-Position spool
3	33343	1	Spool, 4-position control assembly
4	1011955	5	Spool, 3-position control assembly
5	38628-1	2	Control assembly stabilizer
6	33342	1	Valve relief 2000 psi
7	53380	2	Valve relief 2610 psi
8	53381	3	Valve relief 2470 psi w/anti-cavitation check
9	38631-1	2	Plug port relief cavity
10	38632-1	2	Plug, 3/4 SAE male w/O-ring
11	33339	6	Valve, load check assembly
12	38629	2	Handle control-stabilizer
13	1020211	1	Plug, PBY (if required)
NS	33346	6	Spool, seal repair kit

NS Not shown

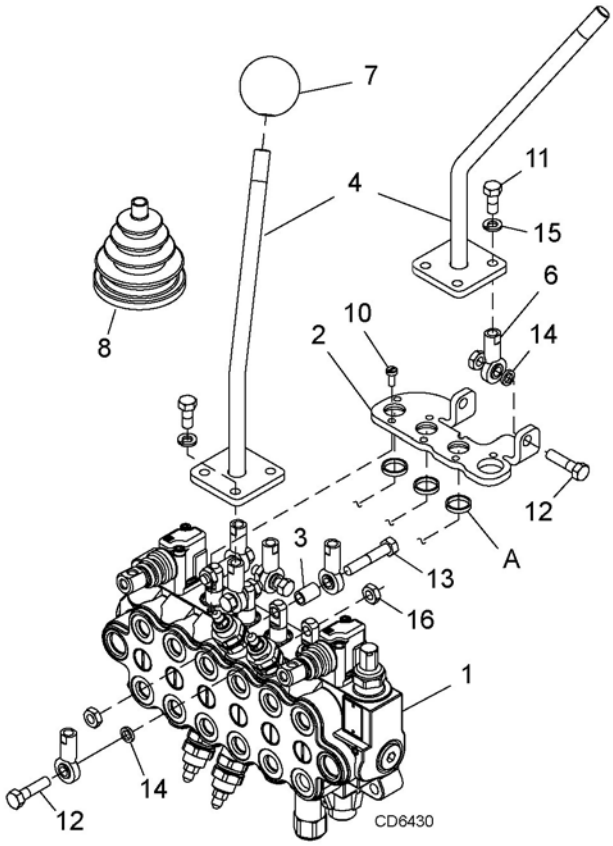
BH80-X CONTROL VALVE ASSEMBLY



REF	PART	QTY	DESCRIPTION
1	1011952	1	Control valve assembly
2	53380	2	Port relief valve 2610 psi
3	53381	3	Port relief valve/anti-cav 2470 psi
4	38631-1	1	Plug, port relief cavity
5	33343	1	Spool position control assembly
6	33345	5	Spool position control assembly
7	38622	1	Valve inlet section
8	30515	8	8mm x 1.25P Hex nut
9	33440	3	8mm x 1.25P x 276 mm Tie rod
10	33339	6	Check valve assembly
11	34368	1	Relief valve assembly
12	38624	1	Boom section without relief
13	38625	5	Valve spool section without relief
14	38628-1	2	Control assembly - Stabilizer
15	38629	2	Control handle - Stabilizer
16	38623	1	Outlet section with plug
17	38632-1	1	Plug, 3/4 SAE M with O-ring
18	37524	8	5M x 0.8P x 12 mm Cap screw
20	33338	7	Section seal repair kit (not shown)
21	33346	6	Spool repair kit (not shown)

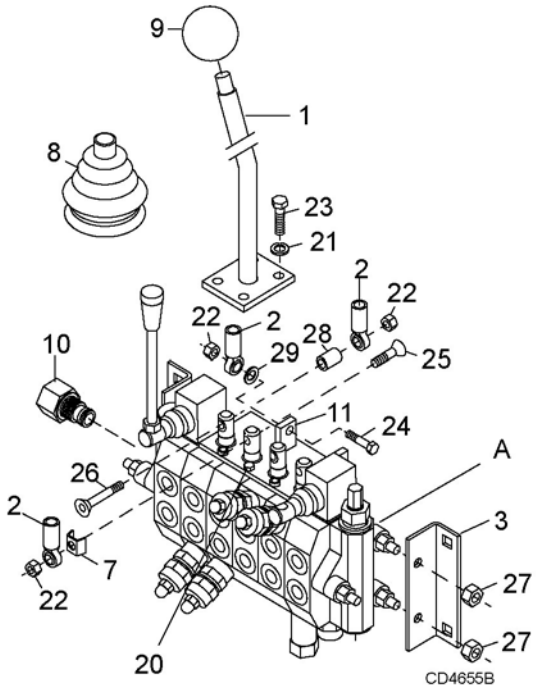
CONTROL VALVE HARDWARE

BH70-X



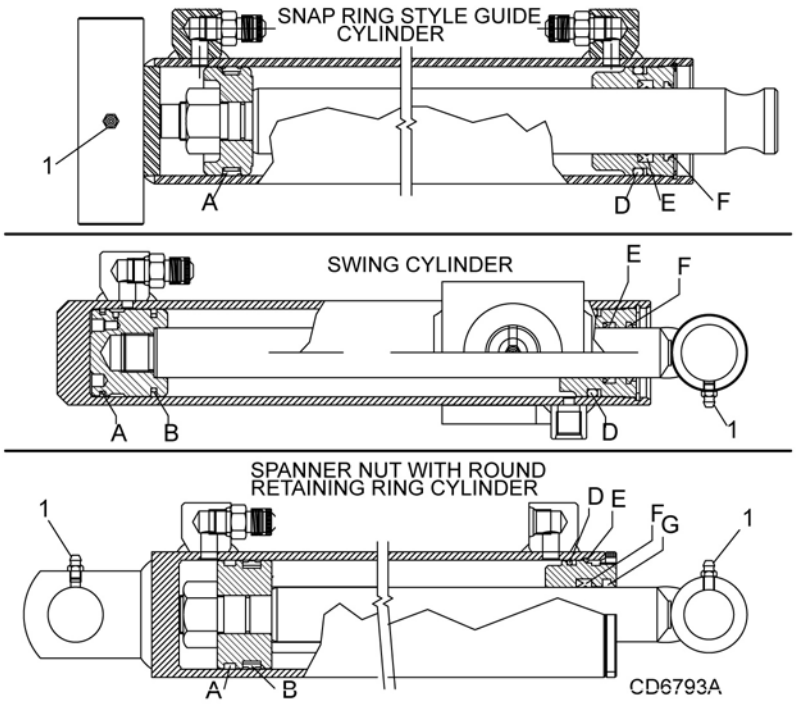
REF	PART	QTY	DESCRIPTION
A	-----	3	Spool wiper (included w/item1)
1	1011951	1	Valve, 6 spool monoblock 2030 psi
2	1008321	1	Plate, control linkage mounting
3	1008322	2	Sleeve .325 x .463 x .680
4	1011865	1	Control handle
6	37613	6	Rod end, 5/16 NF female
7	37672	2	Knob, 1.88 OD x 1/2 NC
8	37765	2	Boot, rubber control
10	-----	7	Screw, slot head M5 x .8 x 12 (included w/item 1)
11	24405	6	5/16 NF x 3/4 Cap screw GR5
12	6250 *	4	5/16 NC x 1-1/4 Cap screw GR5
13	4528 *	2	5/16 NC x 1.75 Cap screw GR5
14	37577	4	Washer, .328 x .50 x .093
15	2472 *	6	Washer, lock 5/16
16	6778 *	6	Nut, lock 5/16 NC
	*		Standard hardware, obtain locally

BH80-X



REF	PART	QTY	DESCRIPTION
A	1011952	1	Valve, 6 spool sectional 2470 psi
1	37573	2	Control handle
2	37613	6	5/16 NF Female rod end
3	37556	2	Valve mounting bracket
7	37548	2	16 GA x .36 x .67 x .63 Clip
8	37765	2	Rubber control boot
9	37672	2	1.88 Dia. x 1/2 NC Knob
10	37409	1	Power-Beyond sleeve (optional)
11	52073	1	Valve linkage mount
20	37524		M5 x .8P x 12 mm Cap screw
21	2472 *		5/16 Standard lock washer
22	6778 *		5/16 NC Hex lock nut
23	24405 *		5/16 NF x 3/4 Cap screw GR5
24	6250 *		5/16 NC x 1-1/4 Cap screw GR5
25	24408 *		5/16 NC x 1-1/2 Cap screw GR5
26	300105 *		5/16 NC x 2 Cap screw GR5
27	30515		M8 x 1.25P Hex nut
28	37551		.328 x .463 x .716 Sleeve
29	37577		.328 x .50 x .093 Washer
	*		Standard hardware, obtain locally

HYDRAULIC CYLINDERS



NOTE: Before ordering seal kits, check stamping on barrel near base end port.

1. If an "E" is stamped on barrel, use part number's in Table 1, column "E".
2. If a "J" is stamped on the barrel, check Woods part number of the complete assembly stamped on the barrel. Locate that part number in Table 1 or Table 2 and order seal kit from the "J" column.

Table 1

Function	Complete Assembly	Base End Style	Retracted Length	Bore Dia	Rod Dia	"E" Seal Kit (a - j)	"J" Seal Kit (a - j)
Swing	1011825	Trunnion	4.50	2.00	1.12	1011991	1024757
Stabilizer	1011823	Tube	17.75	2.50	1.50	1011990	1024756
Dipper (BH70-X)	1011830	Tang	24.70	2.50	1.25	1011997	1024760
Dipper (BH80-X)	1011827	Tang	27.50	2.50	1.37	1011996	1024759
Boom (BH70-X)	1011829	Clevis	23.38	2.50	1.25	37865	1024758
Boom (BH80-X)	1011826	Clevis	26.25	2.50	1.25	37865	1024758
Bucket	1011828	Tube	23.75	2.50	1.25	1011997	1024760

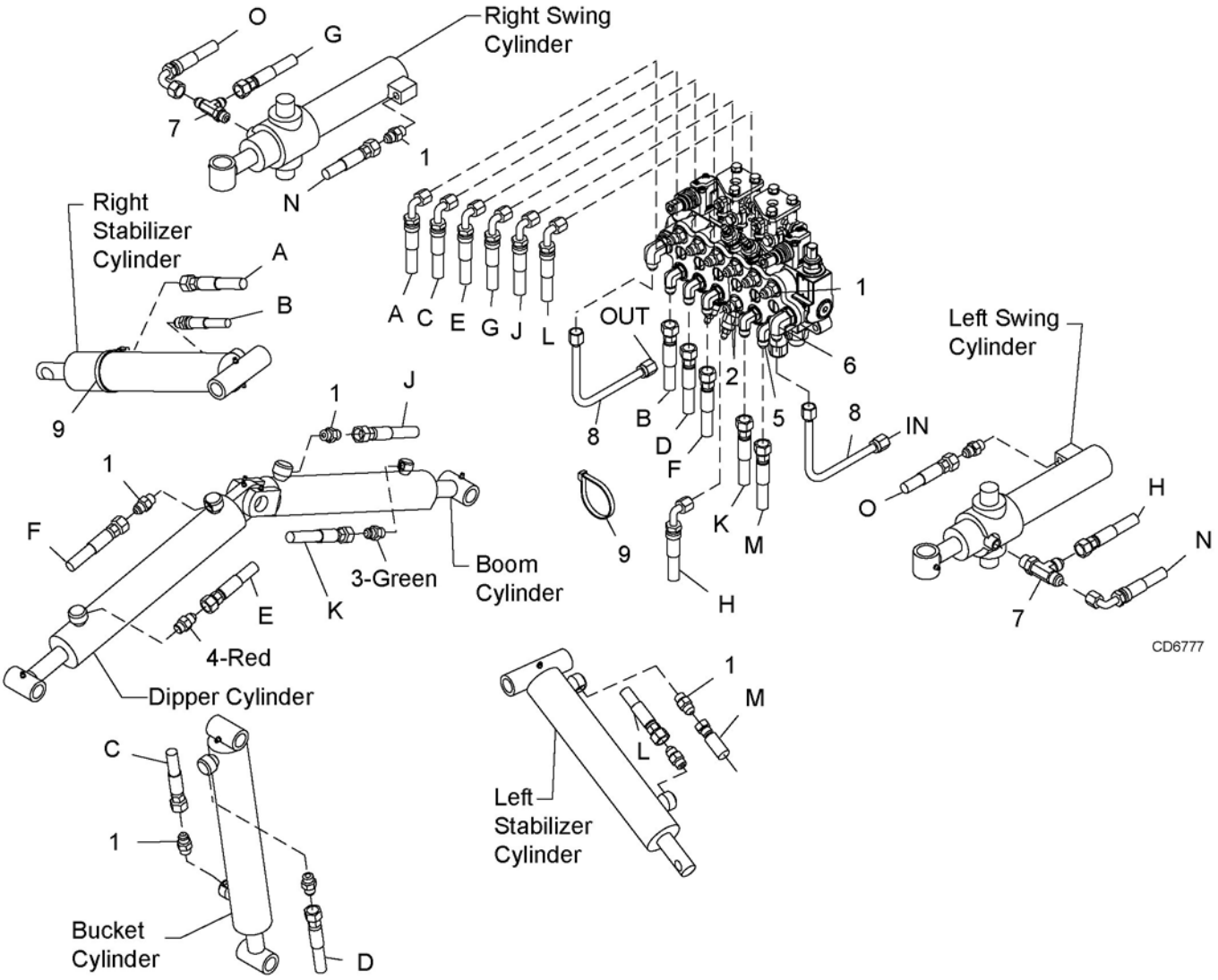
1. - 12296 1/4 28 straight grease fitting 15/32

Table 2

Function	Complete Assembly	Base End Style	Retracted Length	Bore Dia	Rod Dia	"J" Seal Kit (a - j)
Swing	1030005	Trunnion	4.50	2.00	1.12	1030013
Stabilizer	1030003	Tube	17.75	2.50	1.50	1030011
Dipper (BH70-X)	1030010	Tang	24.70	2.50	1.25	1030017
Dipper (BH80-X)	1030007	Tang	27.50	2.50	1.37	1024759
Boom (BH70-X)	1030009	Clevis	23.38	2.50	1.25	1030017
Boom (BH80-X)	1030006	Clevis	26.25	2.50	1.25	1024758
Bucket	1030008	Tube	23.75	2.50	1.25	1030017

1. - 12296 1/4 28 straight grease fitting 15/32

BH70-X HOSES & FITTINGS



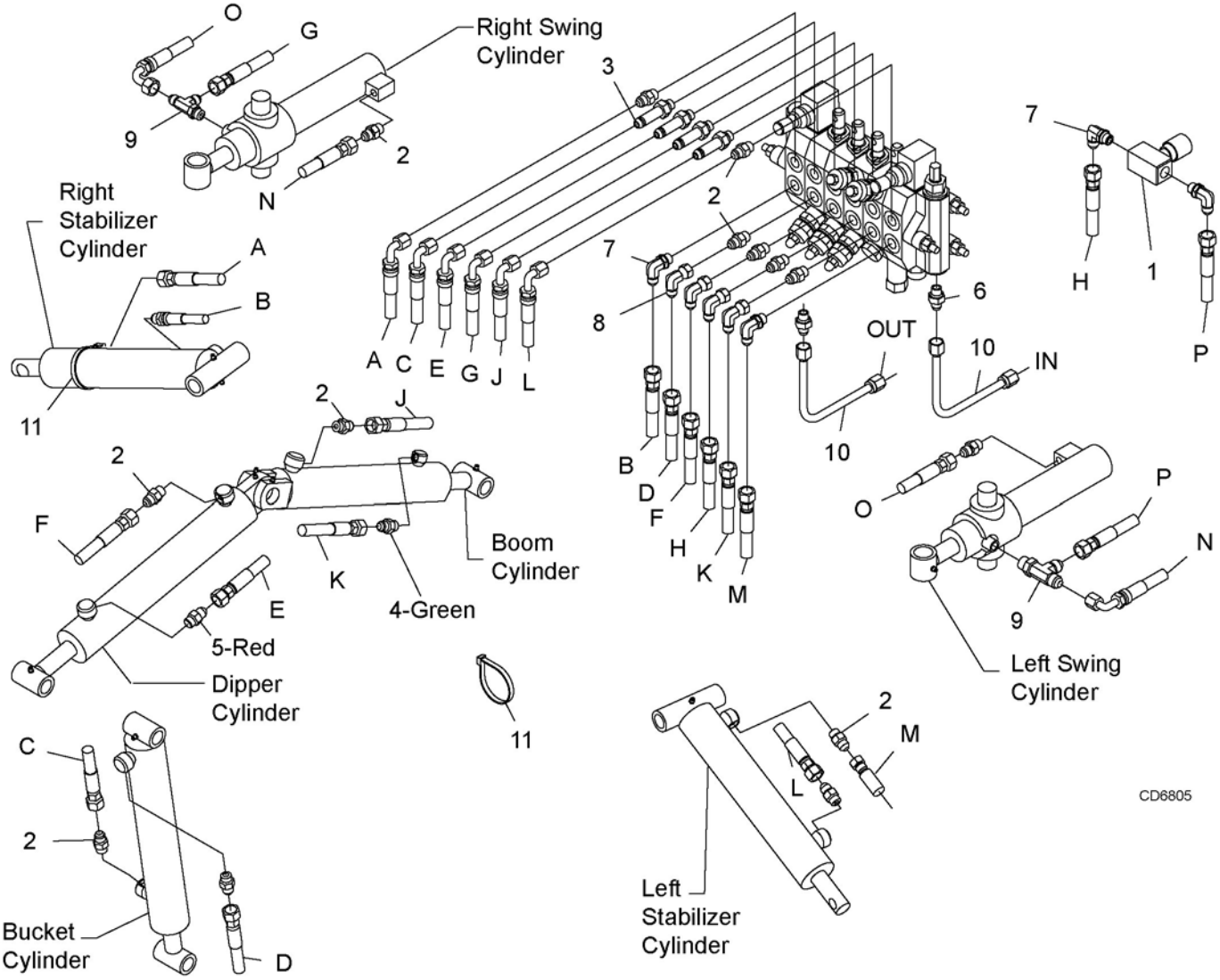
REF	PART	QTY	DESCRIPTION
1	62367	15	9/16-18 to O-ring connector
2	1011814	2	Adapter, 9/16 JICM x 9/16 ORBM restricted .063
3	1011816	1	Adapter, 9/16 JICM x 9/16 ORBM restricted .082 (green)
4	37508	1	Adapter, 9/16 JICM x 9/16 ORBM Restricted .094 (red)
5	63558	5	Elbow, 9/16 ORBM x 9/16 JICM
6	316004	2	Elbow, 3/4 ORBM x 3/4 JICM
7	F1103	2	Tee, 9/16 ORBM x 9/16 JICM
8	1012592	2	Hydraulic tube assembly (BH70-X)
9	65766 *	3	Plastic cable tie, .34 x 34.0

* Standard hardware, obtain locally

HOSE

REF	PART	DESCRIPTION
A	1014241	Hose - 42" x 9/16 JICF x 9/16 JICF 1/4
B	1014240	Hose - 42" x 9/16 JICM x 9/16 JICF 1/4
C	1014232	Hose - 126" x 9/16 JICF x 9/16 JICF 3/8
D	1014231	Hose - 115" x 9/16 JICF x 9/16 JICF 3/8
E	1014229	Hose - 88" x 9/16 JICF x 9/16 JICF 3/8
F	1014228	Hose - 84" x 9/16 JICF x 9/16 JICF 3/8
G	1014233	Hose - 40" x 9/16 JICF x 9/16 JICF 1/4
H	1014233	Hose - 40" x 9/16 JICF x 9/16 JICF 1/4
J	1014227	Hose - 68" x 9/16 JICF x 9/16 JICF 3/8
K	1014242	Hose - 65" x 9/16 JICF x 9/16 JICF 3/8
L	1014241	Hose - 42" x 9/16 JICF x 9/16 JICF 1/4
M	1014240	Hose - 42" x 9/16 JICM x 9/16 JICF 1/4
N	1008340	Hose - 21" x 9/16 JICF x 9/16 JICF 1/4
O	1008340	Hose - 21" x 9/16 JICF x 9/16 JICF 1/4

BH80-X HOSES & FITTINGS

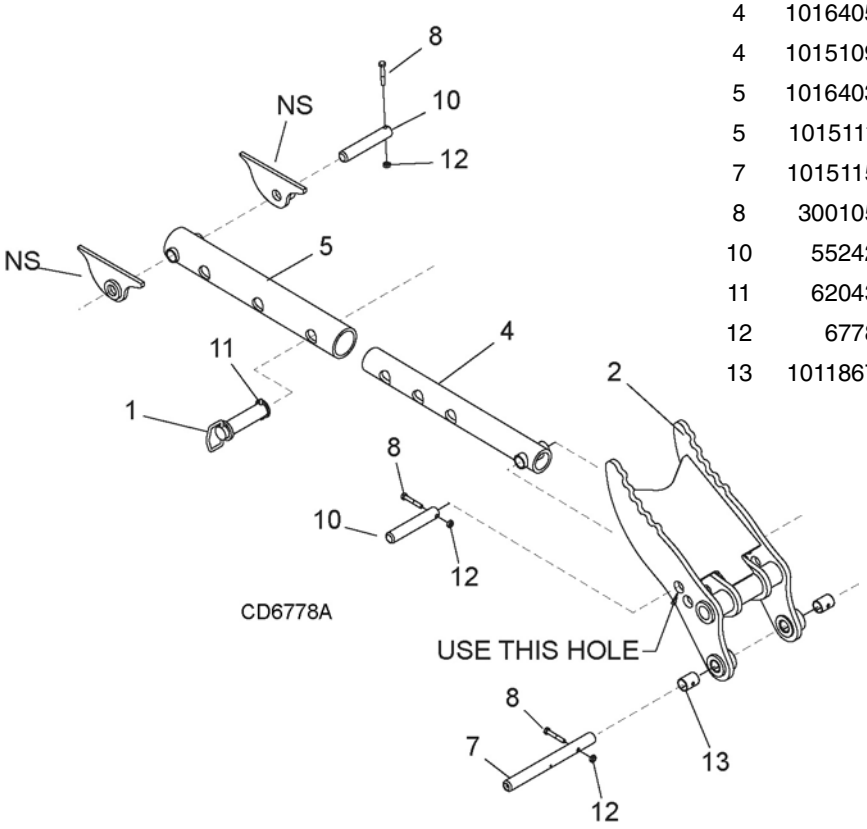


REF	PART	QTY	DESCRIPTION
1	1012510	1	Valve flow control
2	62367	16	Adapter, 9/16 ORBM x 9/16 JICM
3	38605	4	Adapter, 9/16 ORBM x 9/16 JICM long
4	1011816	1	Adapter, 9/16 JICM x 9/16 ORBM restricted .082 (green)
5	37508	1	Adapter, 9/16 JICM x 9/16 ORBM Restricted .094 (red)
6	61	2	Adapter, 3/4 ORBM x 3/4 JICM
7	63558	4	Elbow, 9/16 ORBM x 9/16 JICM
8	38604	4	Elbow, 9/16 JICF x 9/16 JICM
9	F1103	2	Tee, 9/16 ORBM x 9/16 JICM
10	1012593	2	Tube assembly
11	65766 *	3	Plastic cable tie .34 x 34.0
		*	Standard hardware, obtain locally

HOSE

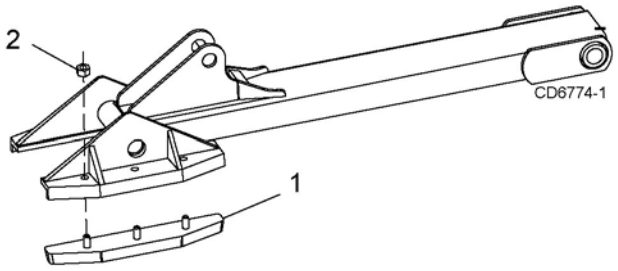
REF	PART	QTY	DESCRIPTION
A	1014241	1	Hose, 1/4 42" 9/16 JICF 9/16 JICF
B	1014240	1	Hose, 1/4 42" 9/16 JICM 9/16 JICF
C	1014247	1	Hose, 3/8 135" 9/16 JICF 9/16 JICF
D	1014246	1	Hose, 3/8 124" 9/16 JICF 9/16 JICF
E	1014245	1	Hose, 3/8 92" 9/16 JICF 9/16 JICF
F	1014244	1	Hose, 3/8 88" 9/16 JICF 9/16 JICF
G	1014233	1	Hose, 1/4 40" 9/16 JICF 9/16 JICF
H	1014237	1	Hose, 1/4 22" 9/16 JICF 9/16 JICF
J	1014243	1	Hose, 3/8 70" 9/16 JICF 9/16 JICF
K	1014242	1	Hose, 3/8 65" 9/16 JICF 9/16 JICF
L	1014241	1	Hose, 1/4 42" 9/16 JICF 9/16 JICF
M	1014240	1	Hose, 1/4 42" 9/16 JICM 9/16 JICF
N	1008340	1	Hose, 1/4 21" 9/16 JICM 9/16 JICF
O	1008340	1	Hose, 1/4 21" 9/16 JICM 9/16 JICF
P	1014238	1	Hose, 1/4 34" 9/16 JICM 9/16 JICF

BH70-X & BH80-X THUMB ASSEMBLY (OPTIONAL)



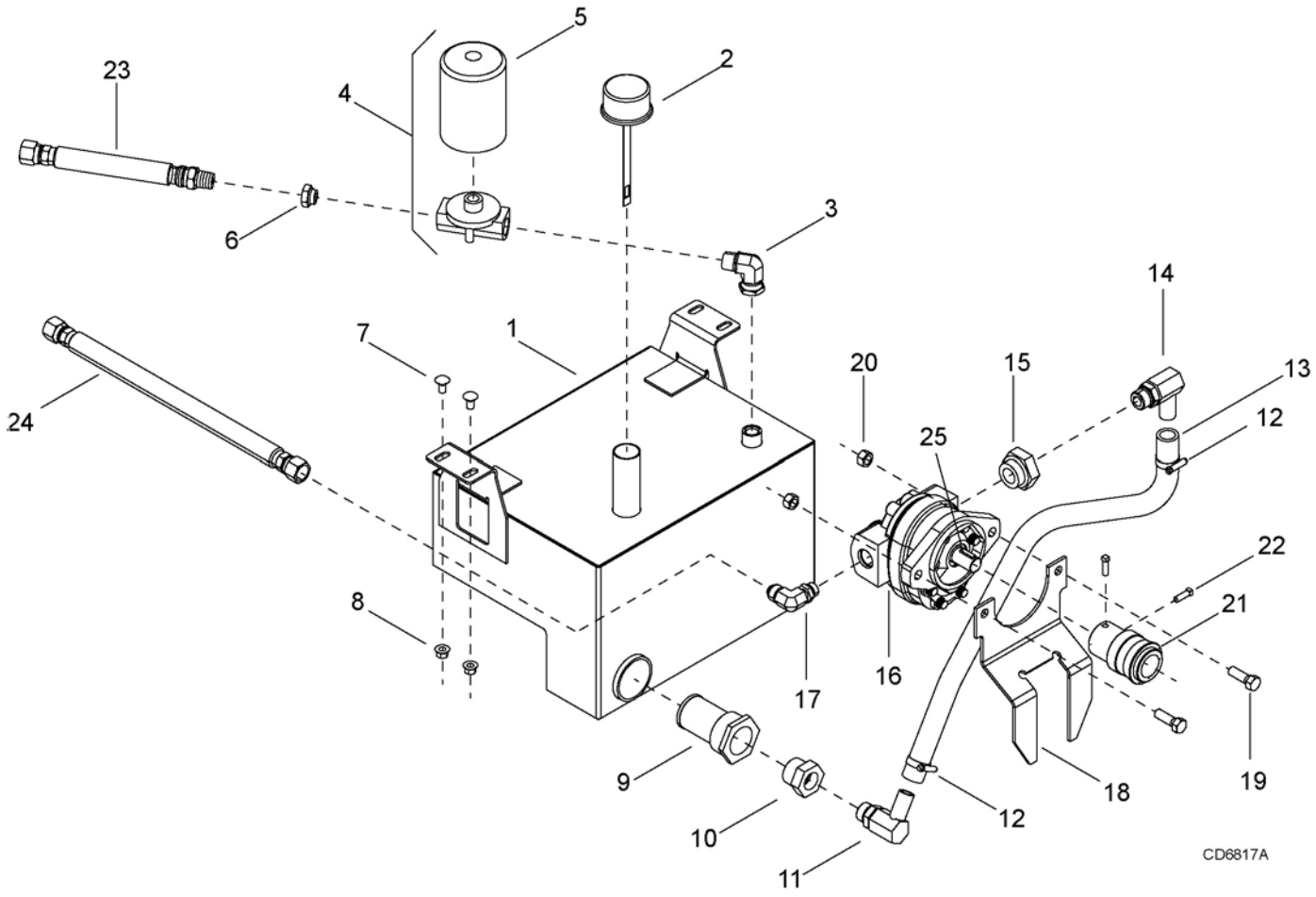
REF	PART	QTY	DESCRIPTION
1	1012609	1	Pin, hitch 1.25 x 4.25
2	1031510	1	Thumb, BH70-X / BH80-X
4	1016405	1	Inner tube, BH70-X **-or-**
4	1015109	1	Inner tube, BH80-X
5	1016403	1	Outer tube, BH70-X **-or-**
5	1015111	1	Outer tube, BH80-X
7	1015115	1	Clevis pin, 1.0 x 10.69
8	300105 *	3	5/16 NC x 2 Hex head cap screw GR5
10	55242	2	Pin, 1.0 x 5.66 headless
11	62043	1	1/4 x 1-3/4 Kilk pin
12	6778 *	3	5/16 NC Lock nut
13	1011867	2	Bearing, 1.00 x 1.13 x 1.50
	*		Standard hardware, obtain locally

STABILIZER STREET PAD KIT (OPTIONAL)



REF	PART	QTY	DESCRIPTION
A	1006610KT	1	Street pad kit (includes item 1 & 2)
1	1006610	4	Rubber stabilizer pad
2	6698 *	12	3/8 NC Lock nut
		*	Standard hardware, obtain locally

BH70-X, BH80-X PUMP & TANK ASSEMBLY (OPTIONAL)



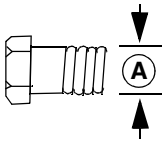
REF	PART	QTY	DESCRIPTION
1	1012590	1	Tank, 13.31 x 15.0 x 21.25
2	31414	1	Breather cap with dipstick
3	1012559	1	Elbow, 3/4 NPTF x 3/4 NPSM
4	62420	1	Filter & housing assembly
5	62421	1	Filter element
6	11815	1	Adapter, 1/2 NPTF x 3/4 NPTM
7	24597 *	4	3/8 NC x 3/4 Carriage bolt
8	14350 *	4	3/8 NC Flange lock nut
9	1012596	1	Tank strainer
10	1012597	1	Adapter, 1-1/4 NPTM x 3/4 NPTF
11	62431	1	Elbow, 3/4 NPTM x 3/4 hose
12	62412 *	2	1/2 Hose clamp, screw

REF	PART	QTY	DESCRIPTION
13	31210	1	Hose, 3/4 x 36"
14	62429	1	Elbow, 90°
15	62428	1	Adapter, 1-5/16 ORBF x 1-5/16 ORBM
16	37909	1	Pump, 2.61 CIR CCW
17	37501	1	Elbow, 3/4 JICM x 1-1/16 NPTM 90°
18	31234	1	Pump mounting bracket
19	3379 *	2	1/2 NC x 1-1/2 Cap screw GR5
20	765 *	2	1/2 NC Lock nut
21	38621	1	Pump adapter, .875 ID 540 RPM
22	62147 *	2	5/16 NC x 1 Set screw
23	1012595	1	Hose, 30" x 3/4 JICF x 1/2 NPTM
24	1012594	1	Hose, 50" x 3/4 JICF x 3/4 JICF
25	62536	1	Key, 1/4 x 1/4 x 15/16

* Standard hardware, obtain locally

BOLT TORQUE CHART

Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.
Fasteners must always be replaced with the same grade as specified in the manual parts list.
Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.
Make sure fastener threads are clean and you start thread engagement properly.
All torque values are given to specifications used on hardware defined by SAE J1701 MAR 99 & J1701M JUL 96.



SAE SERIES TORQUE CHART

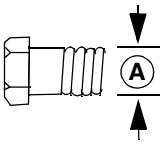
SAE Grade 2 (No Dashes)

SAE Bolt Head Identification

SAE Grade 5 (3 Radial Dashes)

SAE Grade 8 (6 Radial Dashes)

Ⓐ Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	110	149	170	230	240	325
3/4"	1-1/8"	192	261	297	403	420	569
7/8"	1-5/16"	306	416	474	642	669	907
1"	1-1/2"	467	634	722	979	1020	1383



METRIC SERIES TORQUE CHART

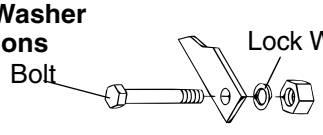
Metric Grade 8.8

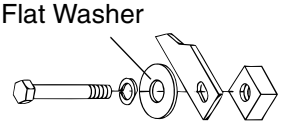
Metric Bolt Head Identification

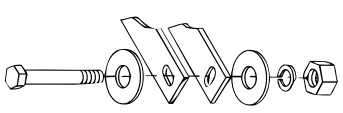
Metric Grade 10.9

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD				MARKING ON HEAD				
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 mm	20	15	27	20	21	16	29	22	8 x 1.0
10 x 1.5	16 mm	39	29	54	40	41	30	57	42	10 x 1.25
12 x 1.75	18 mm	68	50	94	70	75	55	103	76	12 x 1.25
14 x 2.0	21 mm	109	80	151	111	118	87	163	120	14 x 1.5
16 x 2.0	24 mm	169	125	234	173	181	133	250	184	16 x 1.5
18 x 2.5	27 mm	234	172	323	239	263	194	363	268	18 x 1.5
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20 x 1.5
22 x 2.5	34 mm	451	332	623	460	495	365	684	505	22 x 1.5
24 x 3.0	36 mm	571	421	790	583	623	459	861	635	24 x 2.0
30 x 3.0	46 mm	1175	867	1626	1199	1258	928	1740	1283	30 x 2.0

Typical Washer Installations



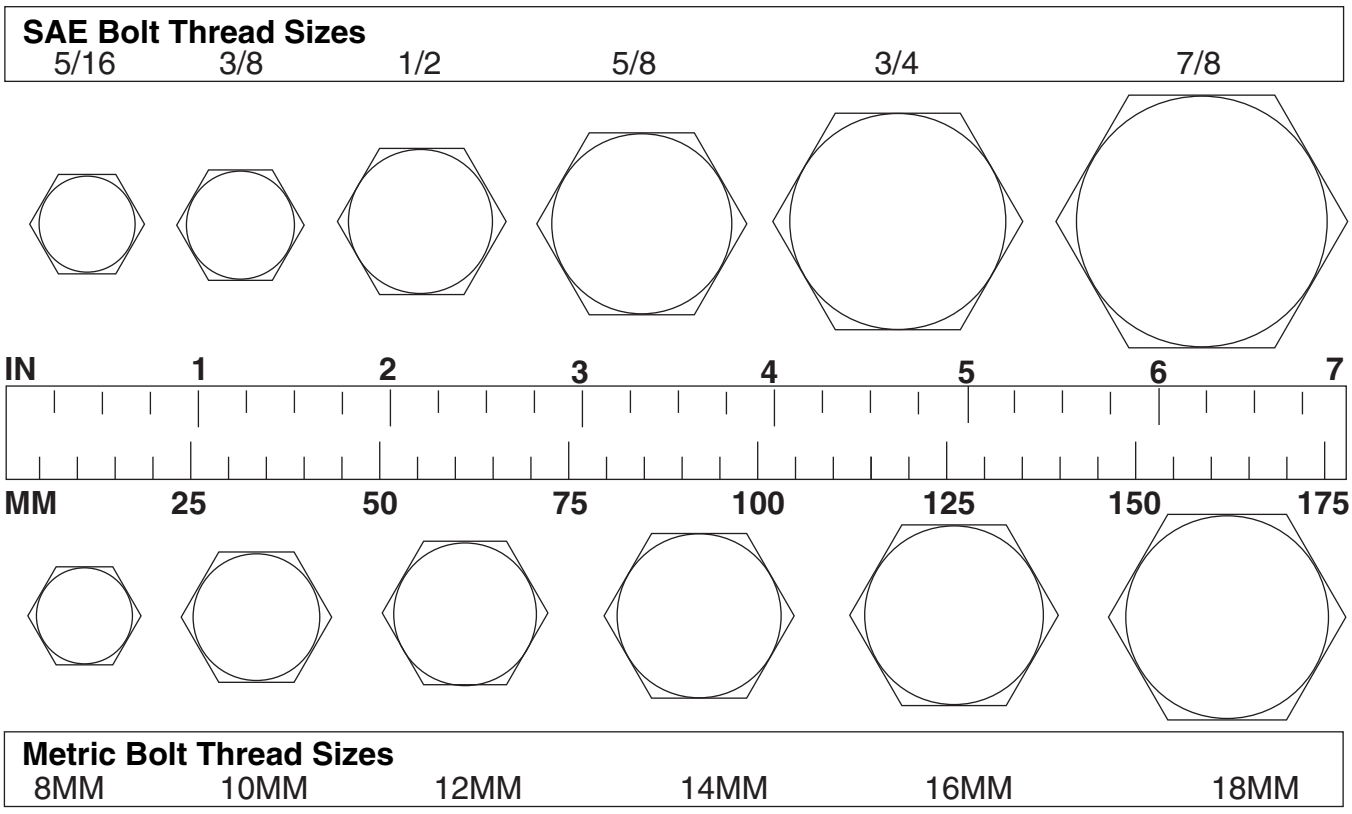




8/9/00

BOLT SIZE CHART

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



ABBREVIATIONS

AG ..... Agriculture
ATF ..... Automatic Transmission Fluid
BSPP ..... British Standard Pipe Parallel
BSPTM ..... British Standard Pipe Tapered Male
CV ..... Constant Velocity
CCW ..... Counter-Clockwise
CW ..... Clockwise
F ..... Female
GA ..... Gauge
GR (5, etc.) ..... Grade (5, etc.)
HHCS ..... Hex Head Cap Screw
HT ..... Heat-Treated
JIC ..... Joint Industry Council 37° Degree Flare
LH ..... Left Hand
LT ..... Left
m ..... Meter
mm ..... Millimeter
M ..... Male
MPa ..... Mega Pascal
N ..... Newton
NC ..... National Coarse
NF ..... National Fine
NPSM ..... National Pipe Straight Mechanical
NPT ..... National Pipe Tapered
NPT SWF ..... National Pipe Tapered Swivel Female
ORBM ..... O-Ring Boss - Male
P ..... Pitch
PBY ..... Power-Beyond
psi ..... Pounds per Square Inch
PTO ..... Power Take Off
QD ..... Quick Disconnect
RH ..... Right Hand
ROPS ..... Roll-Over Protective Structure
RPM ..... Revolutions Per Minute
RT ..... Right
SAE ..... Society of Automotive Engineers
UNC ..... Unified Coarse
UNF ..... Unified Fine
UNS ..... Unified Special

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WARRANTY

(All Models Except Mow'n Machine™ Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Please Enter Information Below and Save for Future Reference.

Date Purchased: _____ From (Dealer): _____

Model Number: _____ Serial Number: _____

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship. Except as otherwise set forth below, the duration of this Warranty shall be for TWELVE (12) MONTHS COMMENCING ON THE DATE OF DELIVERY OF THE PRODUCT TO THE ORIGINAL PURCHASER.

All current model loaders and backhoes are warranted for two (2) years from the date of delivery to the original purchaser.

The warranty periods for specific parts or conditions are listed below:

Part or Condition Warranted	Model Number	Duration (from date of delivery to the original purchaser)
Gearbox components	BW1260, BW1620, BW1800, BW2400	8 years
	BW240HD, BW180HD, BW180HB, BW126HB	7 years
	BB48X, BB60X, BB72X, BB84X, BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, DS1260, DSO1260, DS1440, TS1680, BW126-3, BW180-3, BW240	6 years
	PHD25, PHD35, PHD65, PHD95, 2162, 3240, DS96, DS120, RCC42, RM550-2, RM660-2, RM990-3, PRD6000, PRD7200, PRD8400, 7144RD-2, 9180RD-2, 9204RD-2, S15CD, S20CD, S22CD, S25CD, S27CD, BW180LH	5 years
	RDC54, RD60, RD72, TBW150C	3 years (1 year if used in rental or commercial applications)
Blade spindles	RM550-2, RM660-2, RM990-3, PRD6000, PRD7200, PRD8400, 7144RD-2, 9180RD-2, 9204RD-2	3 years
Rust-through	BB600, BB720, BB840, BB6000, BB7200, BB8400, BW126-3, BW126HB, BW180-3, BW180HB, BW180HD, BW1260, BW1800, BW240, BW240HD, 2162, 3240, DS1260, DSO1260, DS1440, TS1680	10 years

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not apply in the event that the product has been materially modified or repaired by someone other than WOODS, a WOODS authorized dealer or distributor, and/or a WOODS authorized service center. This Warranty does not cover normal wear or tear, or normal maintenance items. This Warranty also does not cover repairs made with parts other than those obtainable through WOODS.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

WOODS makes no warranty, express or implied, with respect to engines, batteries, tires or other parts or accessories not manufactured by WOODS. Warranties for these items, if any, are provided separately by their respective manufacturers.

WOODS' obligation under this Warranty is limited to, at WOODS' option, the repair or replacement, free of charge, of the product if WOODS, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. **The product must be returned to WOODS with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.** WOODS shall complete such repair or replacement within a reasonable time after WOODS receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

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This Warranty is subject to any existing conditions of supply which may directly affect WOODS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, serviceperson, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty. Answers to any questions regarding warranty service and locations may be obtained

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WARRANTY

(Replacement Parts For All Models Except Mow'n Machine™
Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship for a period of ninety (90) days from the date of delivery of the product to the original purchaser with the exception of V-belts, which will be free of defect in material and workmanship for a period of 12 months.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not cover normal wear or tear, or normal maintenance items.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

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